

# Service Manual

 **PIONEER**

036

**REPAIR & ADJUSTMENTS**



**ORDER NO.  
ARP-922-0**

**COMPACT DISC PLAYER**

# PD-6010(BK)

## PD-6010

**MODEL PD-6010 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS.**

Type	Applicable model		Power requirement	Destination
	PD-6010(BK)	PD-6010		
KU	○	—	AC120V only	U.S.A.
KC	○	—	AC120V only	Canada
HEM	○	○	AC220V	European continent
HB	○	○	AC240V	United Kingdom

- This service manual is applicable to the PD-6010/KU, KC, HEM and HB types.
- As to the KC, HEM and HB types please refer to pages 86 — 87.
- As to the circuit and mechanism descriptions, please refer to the PD-9010X service manual (ARP-883).
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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# 1. SAFETY INFORMATION

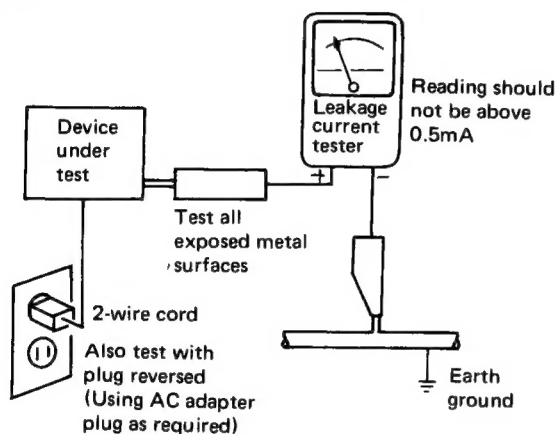
(FOR MODEL KU ONLY)

## 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

## 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR MODEL HEM & HB ONLY)

### VAROITUS!

LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ, SILMILLE VAARALLISTA INFRAPUNASÄTEILYÄ LAITTEEN SISÄLLÄ ON LASERDIODIN LÄHEISYYDESSÄ KUVAN 1. MUKAINEN VAROITUSMERKKI.



LASER  
Kuva 1  
Lasersäteilyn  
varoituserkki

### WARNING!

DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.



LASER  
Picture 1  
Warning sign for  
laser radiation

### ADVERSEL:

USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSÆTTELSE FOR STRÅLING.

### IMPORTANT

PIONEER COMPACT DISC PLAYER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. ALL OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

**QUESTIONNAIRE****MODEL**

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

**1. SERVICING EVALUATION**

Circle applicable number:

Good

Fair

Poor

a. Disassembly/Re-assembly:

1

2

3

\*4

\*5

b. Circuit Checks:

1

2

3

\*4

\*5

c. Replacement of Parts:

1

2

3

\*4

\*5

d. Adjustment (s):

1

2

3

\*4

\*5

\* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

## 2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

## 3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by :

Date :

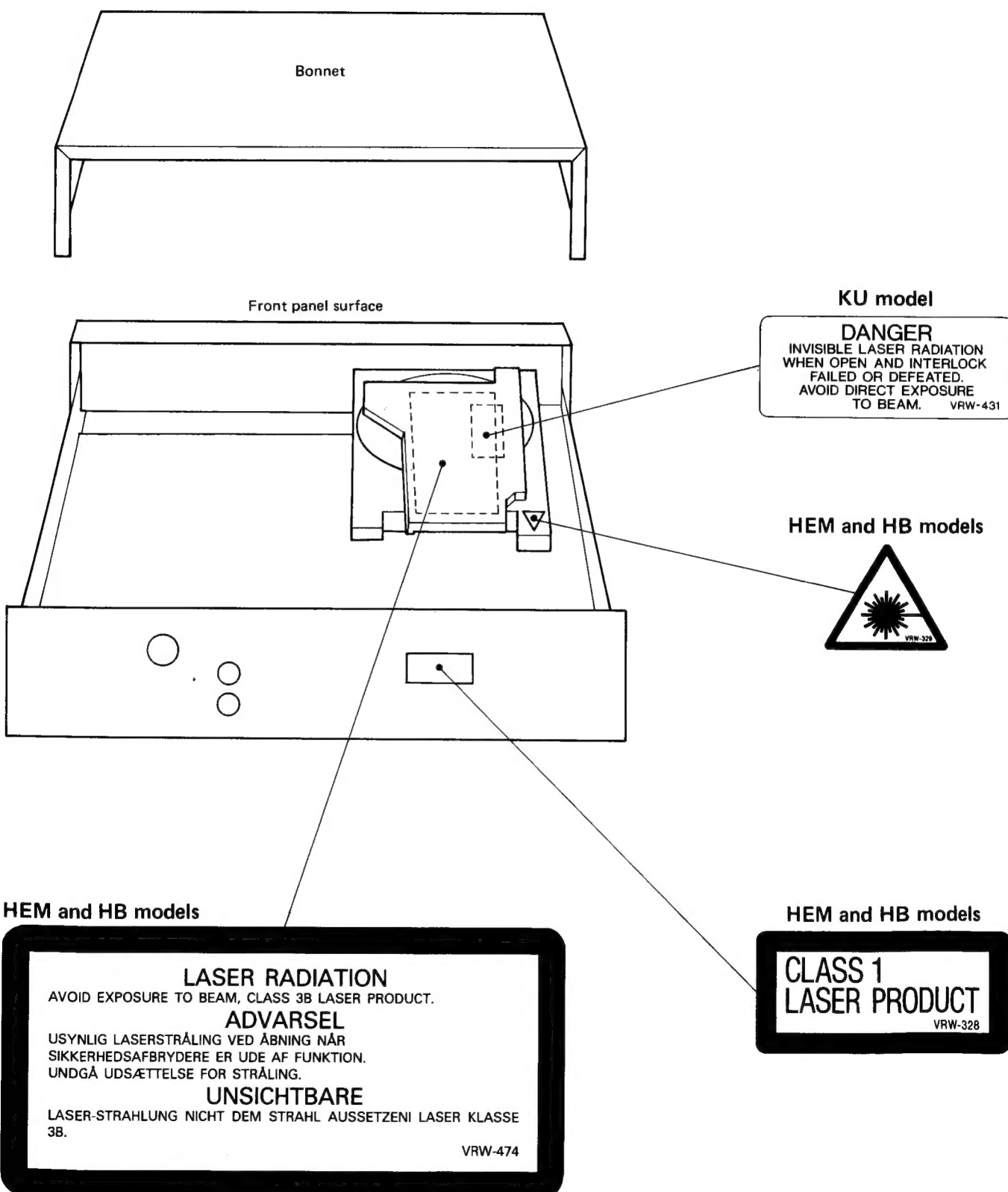
Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

# LABEL CHECK



## 2. SPECIFICATIONS

### 1. General

Type . . . . . Compact disc digital audio system  
 Usable discs . . . . . Diameter 120 mm  
    Thickness 1.2 mm  
 Maximum playing time: 60 minutes or more (stereo)  
    Linear speed: 1.2 ~ 1.4 m/sec  
 Rotation direction (signal side): Counterclockwise  
 Signal format . . . . . Sampling frequency: 44.1 kHz  
    Sampling bit number: 16 bit linear  
    Transmission bit rate: 4.3218 Mbit/sec.  
    Modulation system: EFM  
    Error correction system: CIRC  
    Preemphasis: 50/15  $\mu$ sec (during use)  
 Laser used . . . . . Semiconductor laser: wavelength 780 nm  
 Power requirements  
   HEM model . . . . . AC 220V, 50, 60 Hz  
   HB model . . . . . AC 240V, 50, 60 Hz  
   KU, KC models . . . . . AC120V, 60 Hz  
 Power consumption  
   HEM, HB models . . . . . 17 W  
   KU, KC models . . . . . 16 W  
 Operating temperature . . . . . +5°C ~ +35°C  
 Weight . . . . . 4.8 kg (10 lb 9 oz)  
 External dimensions . . . . . 420(W) x 310(D) x 91(H)mm  
    16-1/2(W) x 12-1/5(D) x 3-3/5(H)in

### 2. Audio section

Frequency response . . . . . 2 Hz ~ 20 kHz  $\pm$  0.5 dB  
 S/N . . . . . 96 dB (1 kHz)  
 Dynamic range . . . . . 95 dB (1 kHz)  
 Channel separation . . . . . 93 dB (1 kHz)  
 Wow and flutter . . . . . Quartz oscillator accuracy  
 Total harmonic distortion . . . . . 0.002% (1 kHz, 0 dB)  
 Total harmonic distortion and noise  
    . . . . . 0.004% (1 kHz, 0 dB)  
 Output voltage . . . . . 2 Vrms (1 kHz, 0 dB)  
 Channels . . . . . 2-channel (stereo)

### 3. Functions

- Play
  - Manual search
  - All-track repeat
  - Programmed playback
  - Programmed repeat
  - Pause
  - Track search
  - Initial play from selected track
- \* The above functions can be controlled via remote control.

### 4. Accessories

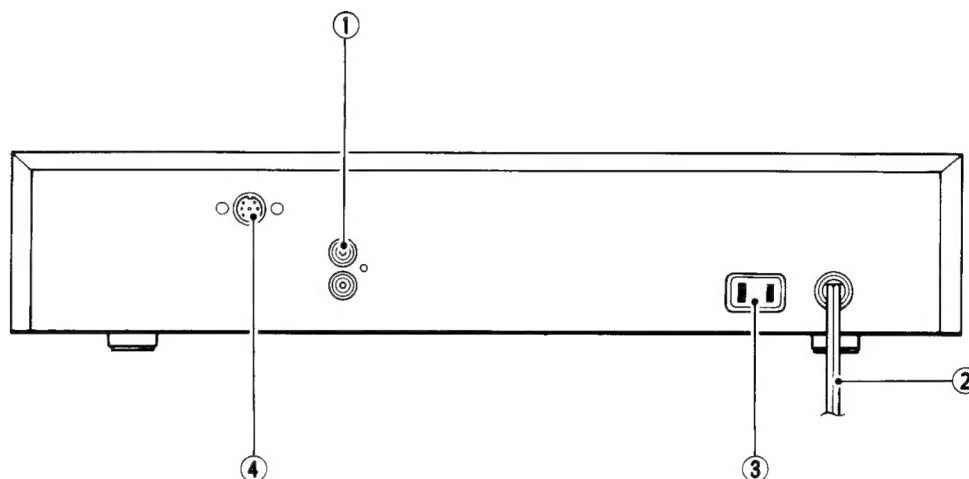
- Remote control unit . . . . . 1
- Batteries (AAA/R03) . . . . . 2
- Pin-plug audio cable . . . . . 1
- Operating Instructions . . . . . 1

#### NOTE:

*Specifications and design subject to possible modification without notice, due to improvements.*

### 3. PANEL FACILITIES

#### REAR PANEL



① AUDIO OUT terminals

② Power cord

③ AC OUTLET (UNSWITCHED, MAX. 100W)

[Only U.S.A. model is provided with this outlet. Other models are not provided with this outlet.]

- Power is continuously supplied to the component connected here, regardless of the setting of the power switch (ON/OFF). Turn the connected component ON/OFF by using its own power switch.
- Do not connect any component having a power consumption exceeding 100W.

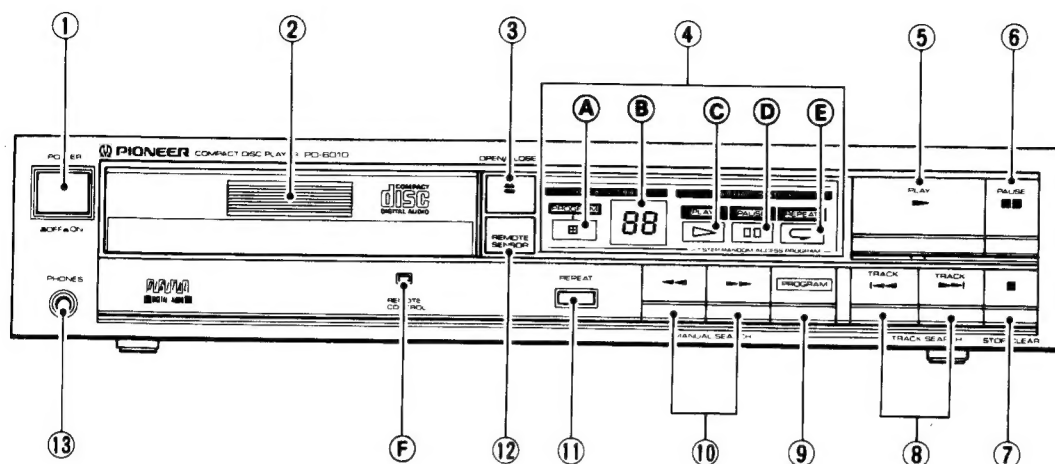
④ SUBCODE OUT terminal

This terminal will be used for outputting subcodes (data recordable on compact discs together with audio signals) in future audio applications.

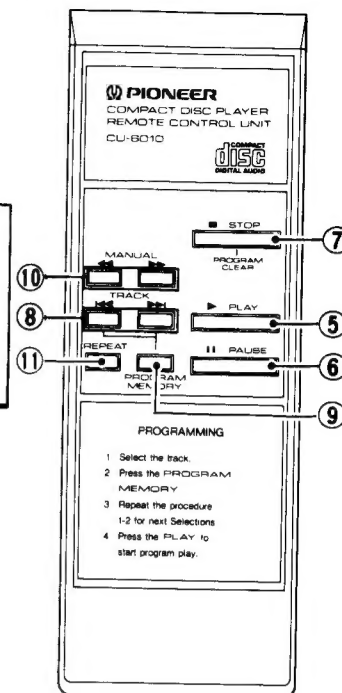
#### NOTE:

- Never connect any appliance (toaster, hair dryer, etc.) whose power consumption exceeds the wattage (W) noted on the outlet panel. Damage to components or fire hazards could result.
- Even if a television set has a rated power consumption less than the permissible outlet wattage, when its power is first turned on it may have a temporary electrical current flow that exceeds the permissible value. For this reason, do not connect television sets or monitors to this outlet.

## FRONT PANEL



## REMOTE CONTROL UNIT



### ① POWER switch

Press to turn power to the unit ON and OFF.

### ② Disc tray

Compact discs are loaded here. When the power is turned on and the OPEN/CLOSE switch is pressed, the disc tray opens toward the front. To close the tray, either press the OPEN/CLOSE switch again, or push the tray in manually.

### ③ OPEN/CLOSE switch

Press to open or close the disc tray. The disc tray alternately opens and closes each time the switch is pressed.

### ④ Indicators

- ① PROGRAM : Lights after tracks are programmed.
- ② TRACK : Indicates the number of the track currently playing or being programmed.
- ③ PLAY : Lights during playback.
- ④ PAUSE : Lights during the pause mode (playback has been temporarily interrupted).
- ⑤ REPEAT : Lights during repeat play.
- ⑥ REMOTE CONTROL : Lights when a command signal is received from the remote control unit.

### ⑤ PLAY key

Press to begin playback, and to release the player from the pause mode.

### ⑥ PAUSE key

Press to temporarily interrupt playback. When pressed again, the player is released from the pause mode.

### ⑦ STOP/CLEAR key

Press to stop playback. When pressed, all operations stop. Also, when the player is in the stop mode, press this key to cancel memorized contents of programmed play.

### ⑧ TRACK SEARCH keys

When the player is in the normal play or programmed play modes, or during the pause mode, these keys are pressed to perform search for a desired track. When pressed, the disc will be advanced to the next track, or reversed to the previous track.

[▶] : When pressed once, the disc playback advances to the beginning of the next track; when pressed continuously, the disc playback moves to the beginning of succeeding tracks on the disc (during programmed playback, it moves to the beginning of the next programmed track).

[◀] : When pressed once, the disc playback returns to the beginning of the currently playing track; when pressed continuously, the disc playback moves further in reverse to the beginning of previous tracks on the disc (during programmed playback, it returns to the beginning of the previously programmed track).



### ⑨ PROGRAM key (PROGRAM MEMORY)

Use to memorize desired programs for programmed playback. Press this key after selecting a desired track with the track search key. Tracks will be memorized in the order the keys are pressed.

### ⑩ MANUAL SEARCH keys

These keys are pressed to perform fast forward and fast reverse when the player is in the play or pause mode. The function operates only during the time the keys are held depressed; if the keys are held depressed for three seconds or more, the speed increases.

[▶▶] : Fast forward is performed (if end of disc is reached, player enters the pause mode).

[◀◀] : Fast reverse is performed (if beginning of disc is reached, player enters the pause mode).

During programmed play, the player will enter the pause mode just before moving to the next (or previous) track.

### ⑪ REPEAT key

Press to perform repeat playback.

- When pressed during the normal playback mode, all tracks on the disc will be played back repeatedly.
- During programmed playback, the programmed tracks will be played back repeatedly in the programmed order.

### ⑫ REMOTE CONTROL SIGNAL RECEIVER (REMOTE SENSOR)

### ⑬ PHONES terminal

When using headphones, connect their plug here.

Player operations and corresponding indicator displays

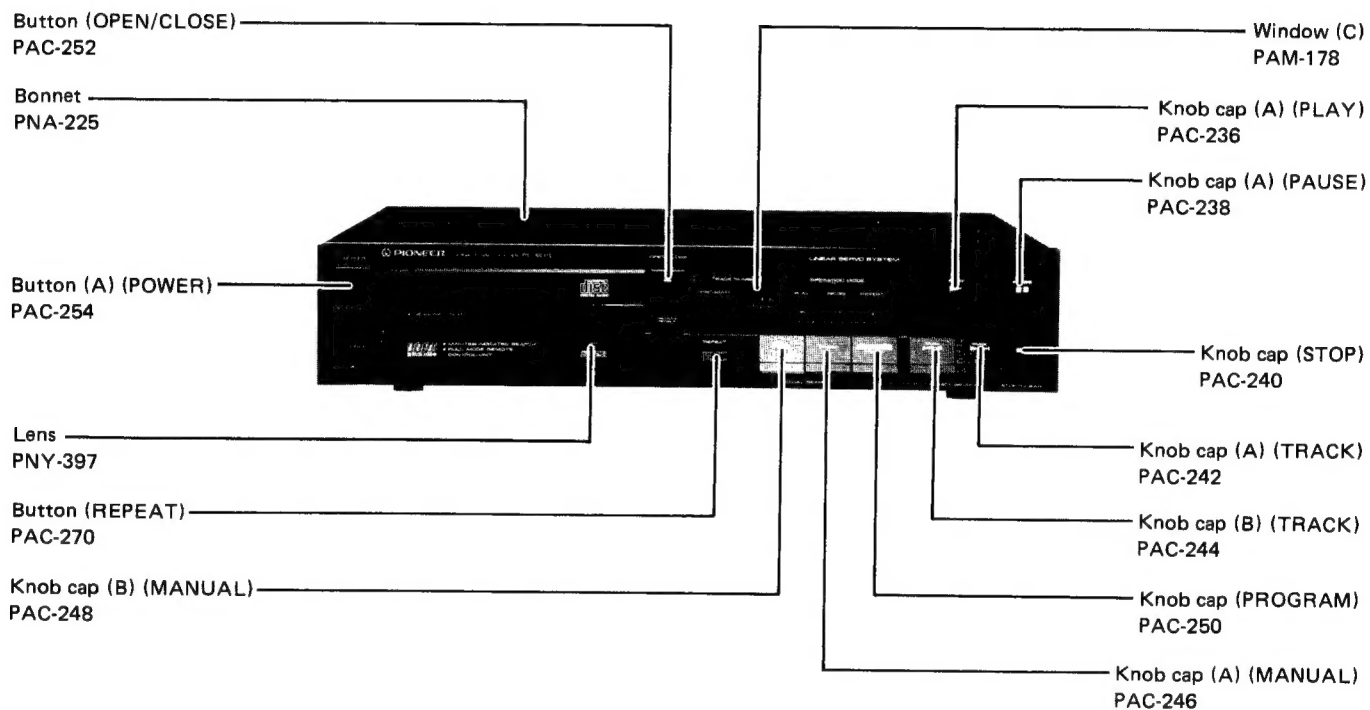
Operating mode	Indicator display		Comments
	TRACK	Other	
Power ON Disc tray OPEN	0 0		After OP display, 00.
Disc tray CLOSE	Total number of tracks		Displayed for 4 seconds only, thereafter same as "Stop" mode.
Stop mode	0 1		4 seconds after TOC is read. At end of playback, when STOP/CLEAR key is pressed.
Playback mode (Play, Program, Repeat) Pause mode	Currently playing track no.	<ul style="list-style-type: none"> <li>• During playback, PLAY lights; during pause, PAUSE lights.</li> <li>• During programmed or repeat playback, PLAY or PAUSE lights.</li> </ul> Depending on play mode, PROGRAM or REPEAT lights.	

## 4. PARTS LOCATIONS

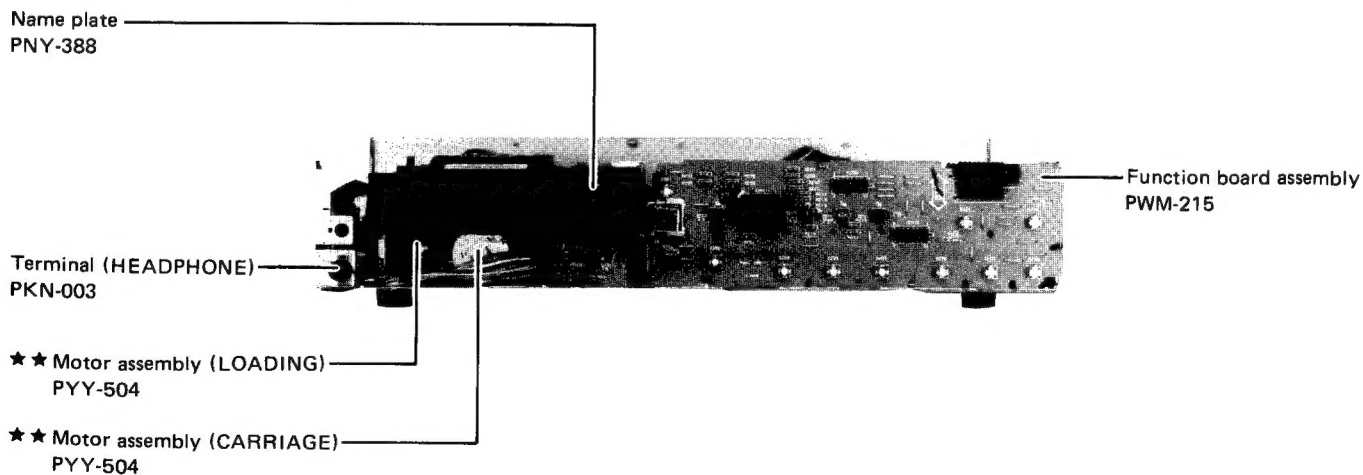
### NOTES:

- The  $\triangle$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks  $\star\star$  and  $\star$ .  
 $\star\star$  GENERALLY MOVES FASTER THAN  $\star$   
 This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

### Front Panel View



### Front View with Front Panel Removed



## Rear Panel View

Terminal (SUBCODE OUT)  
PKP-038

⚠ AC Socket (AC OUTLETS)  
PKN-003

⚠ Strain relief  
CM-22

⚠ AC Power cord  
ADG-046

Terminal (AUDIO OUT)  
VKB-006

## Top View

⚠ ★ Power transformer (120V)  
PTT-233

⚠ Primary board assembly

⚠ ★ ★ Power switch (POWER)  
VSA-006

⚠ Main board assembly  
XWM-216

Joint (POWER)  
PNY-366

## Side View

⚠ ★ ★ Power switch (POWER)  
VSA-006

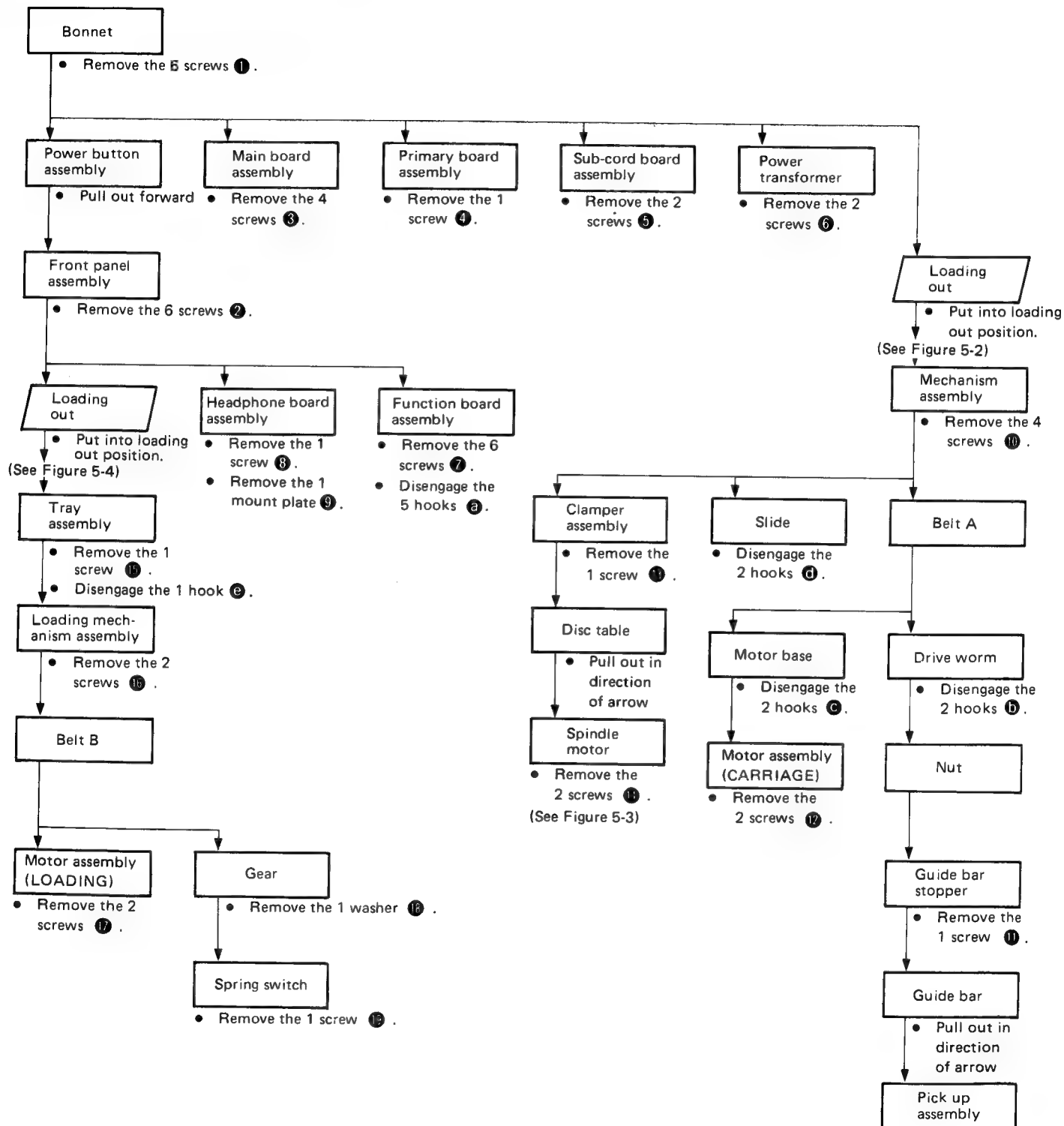
Clamper holder  
PNY-352

Tray  
PNY-406

Pickup assembly  
PWY-004

Disc table  
PNY-272

## 5. DISASSEMBLY



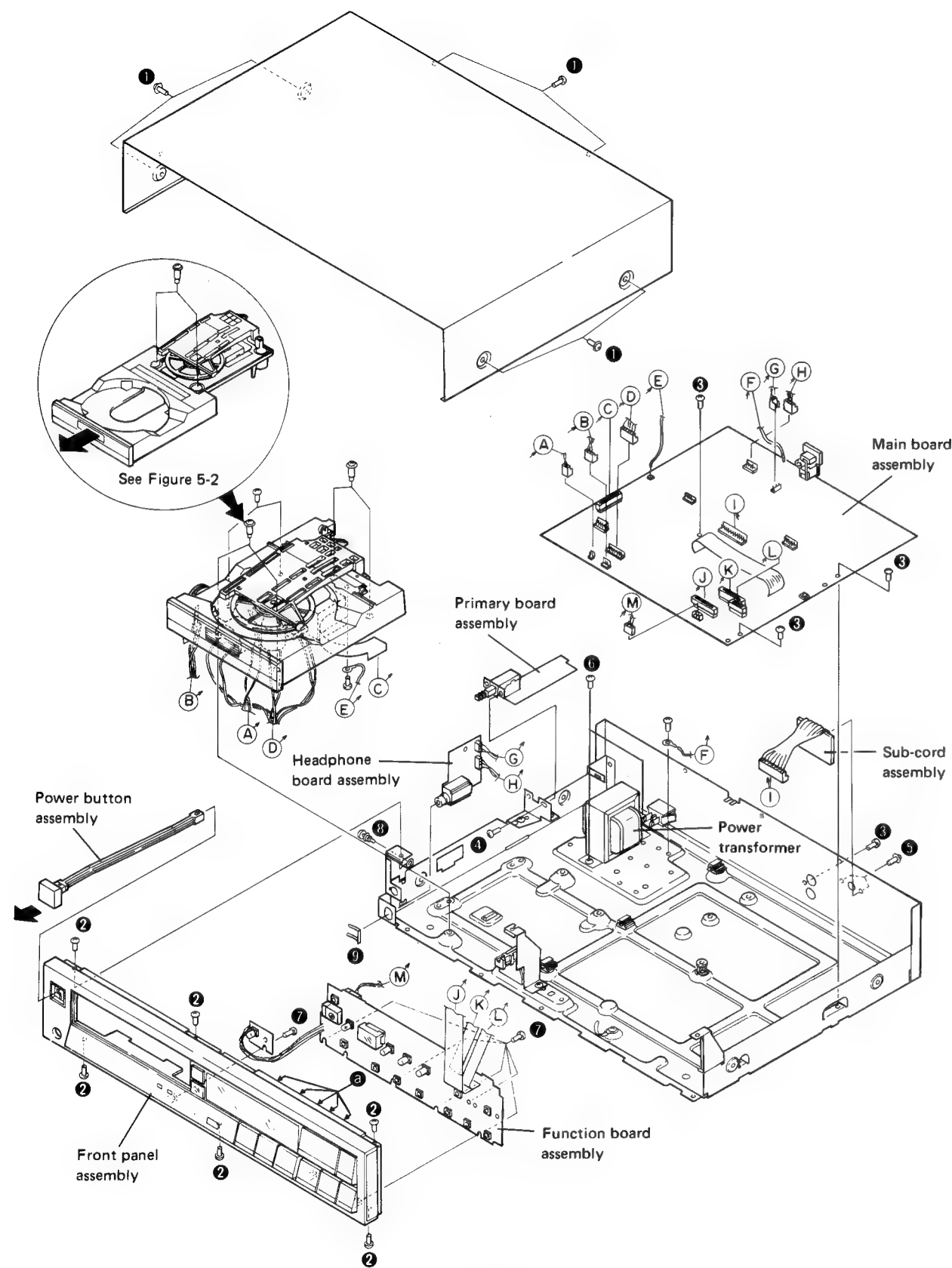


Fig. 5-1 Disassembly

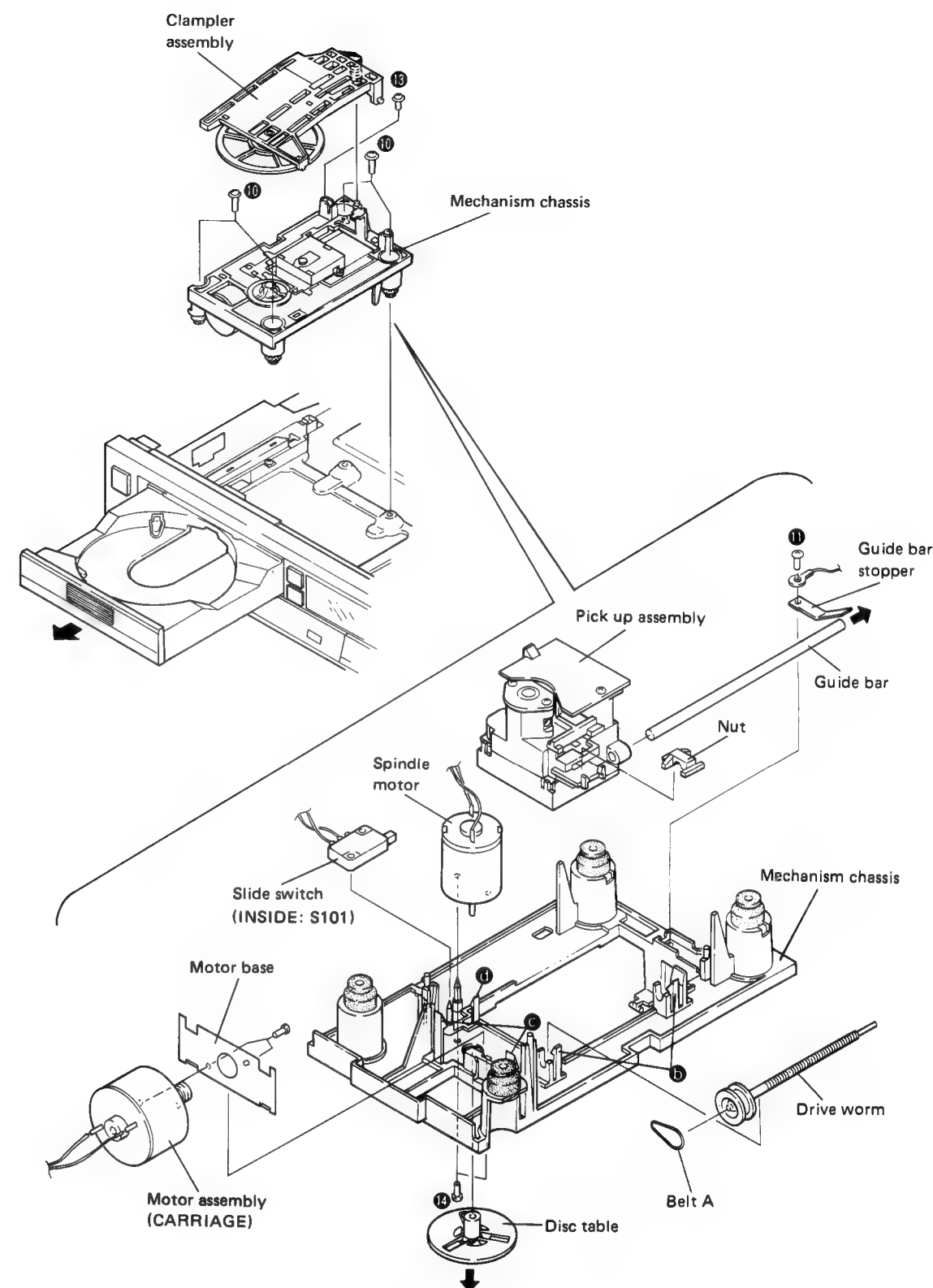


Fig. 5-2 Disassembly

• Disctable

When the section, always below the hexagonal wrench shown in Figure 5-2 directly above.

NOTE:  
 $\phi 4\text{mm}$  hex wrench set

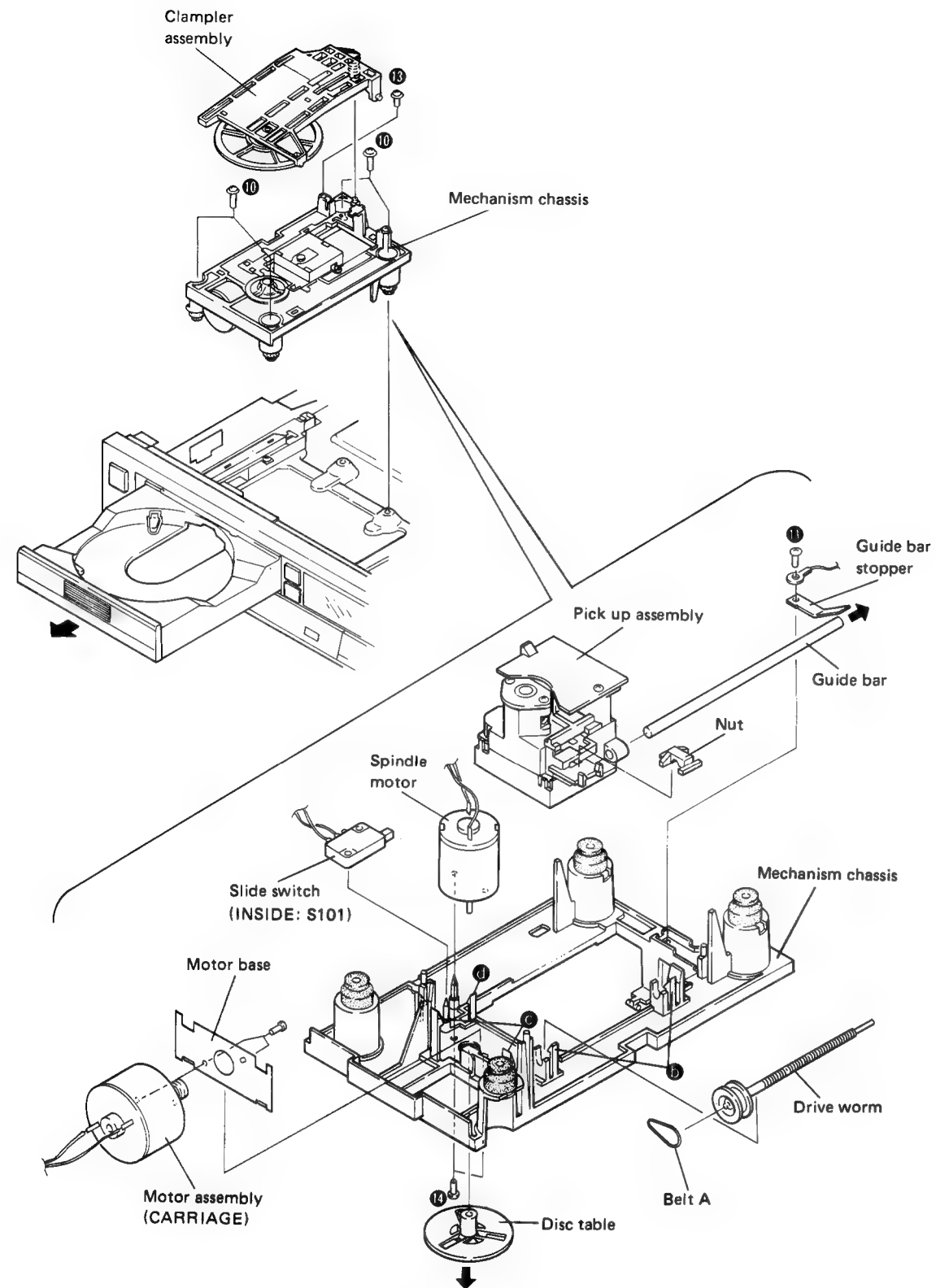


Fig. 5-2 Disassembly

### • Disctable Assembly Procedures

When the disc table is remounted by pressure insertion, always make contact with the stopper below the spindle motor, insert a spacer ( $\phi 4\text{mm}$  hexagonal wrench, etc.) to ensure that the gap between the disc table and mechanism chassis is as shown in Figure 5-3, and apply pressure from directly above. (Pressure of approx. 9kg.)

#### NOTE:

$\phi 4\text{mm}$  hexagonal wrench is included hexagonal wrench set. (No. GGH-003).

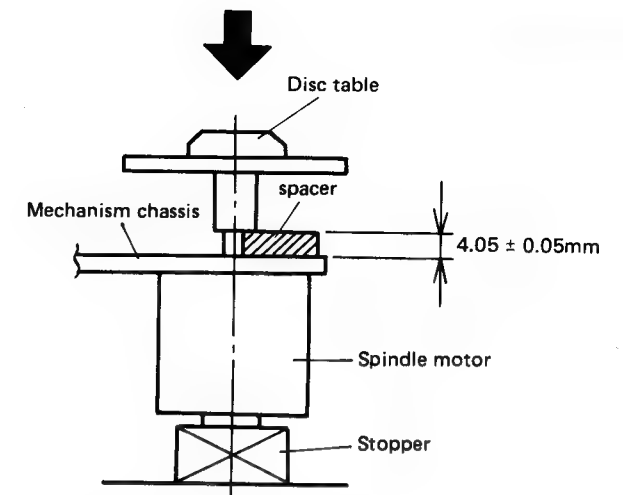


Fig. 5-3 Disctable assembly

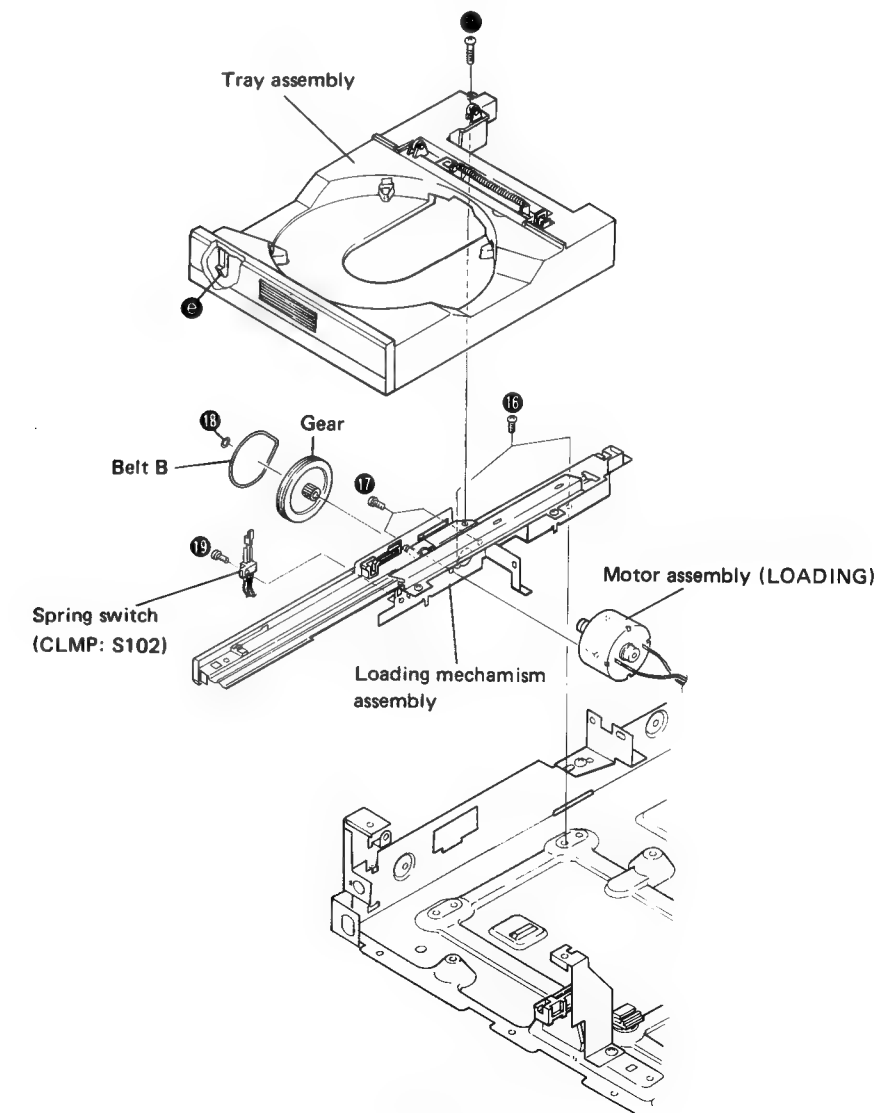


Fig. 5-4 Disassembly

6. EXPLODED VIEWS AND PARTS LIST

6.1 EXTERIOR

A

B

C

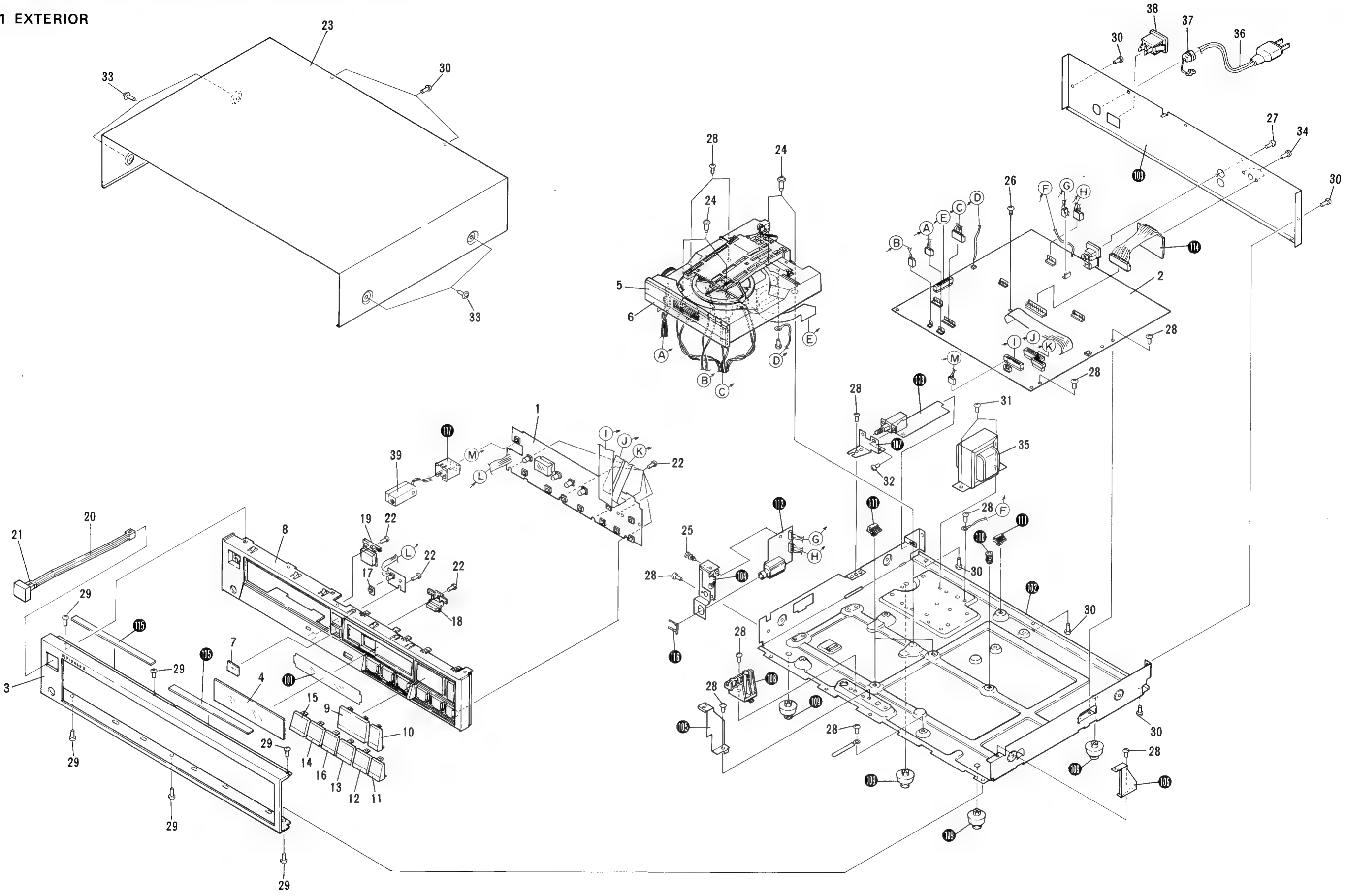
D

A

B

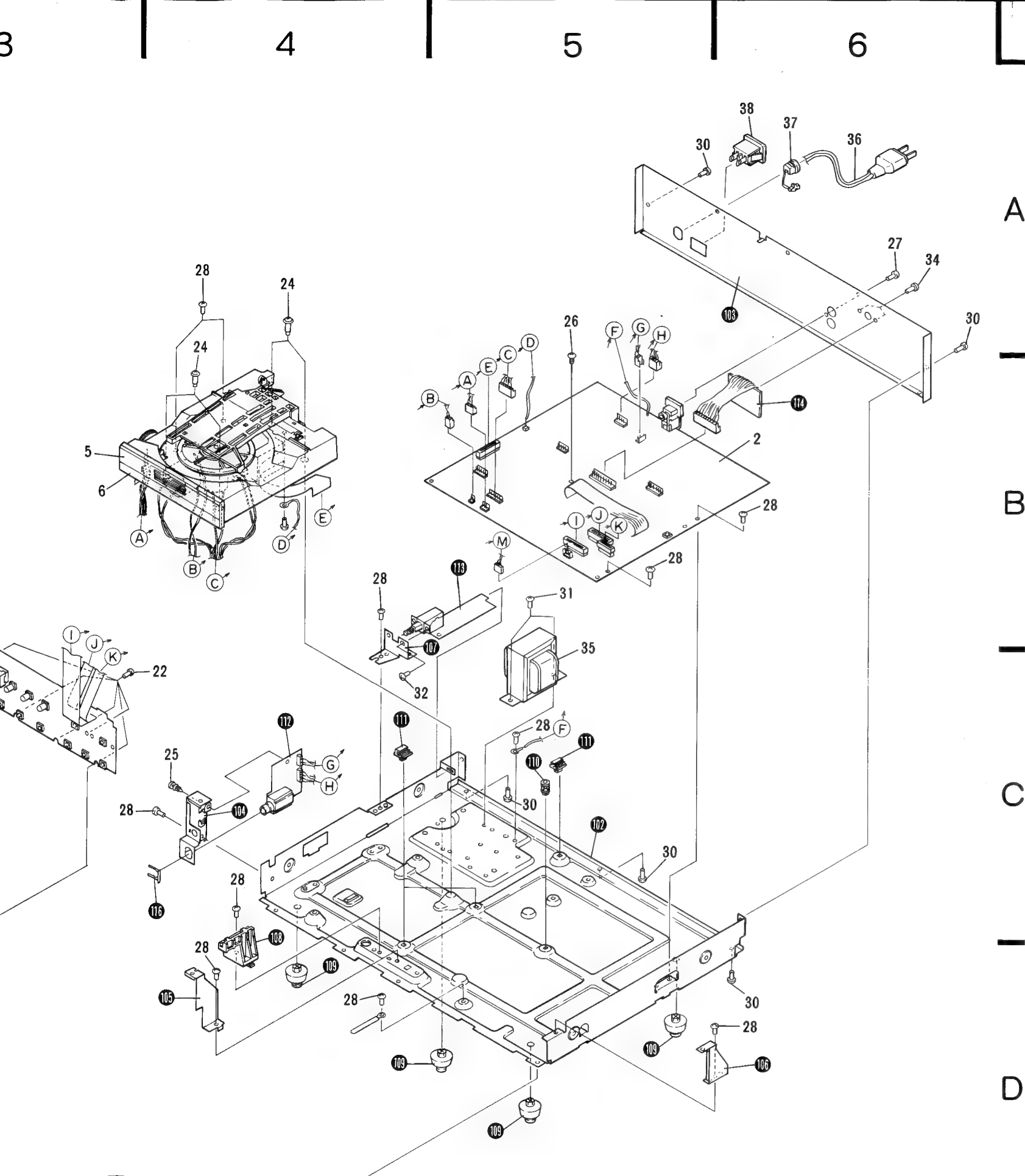
C

D




Parts List of Ex










Mark	No.	Pa
	1.	PV
	2.	XV
	3.	PA
	4.	PA
	5.	PN
	6.	PA
	7.	PN
	8.	PN
	9.	PA
	10.	PA
	11.	PA
	12.	PA
	13.	PA
	14.	PA
	15.	PA
	16.	PA
	17.	PN
	18.	PA
	19.	PA
	20.	PA
	21.	PN
	22.	PP
	23.	PN
	24.	PE
	25.	PE
	26.	PP
	27.	PP
	28.	BB
	29.	BB



# NOTES:

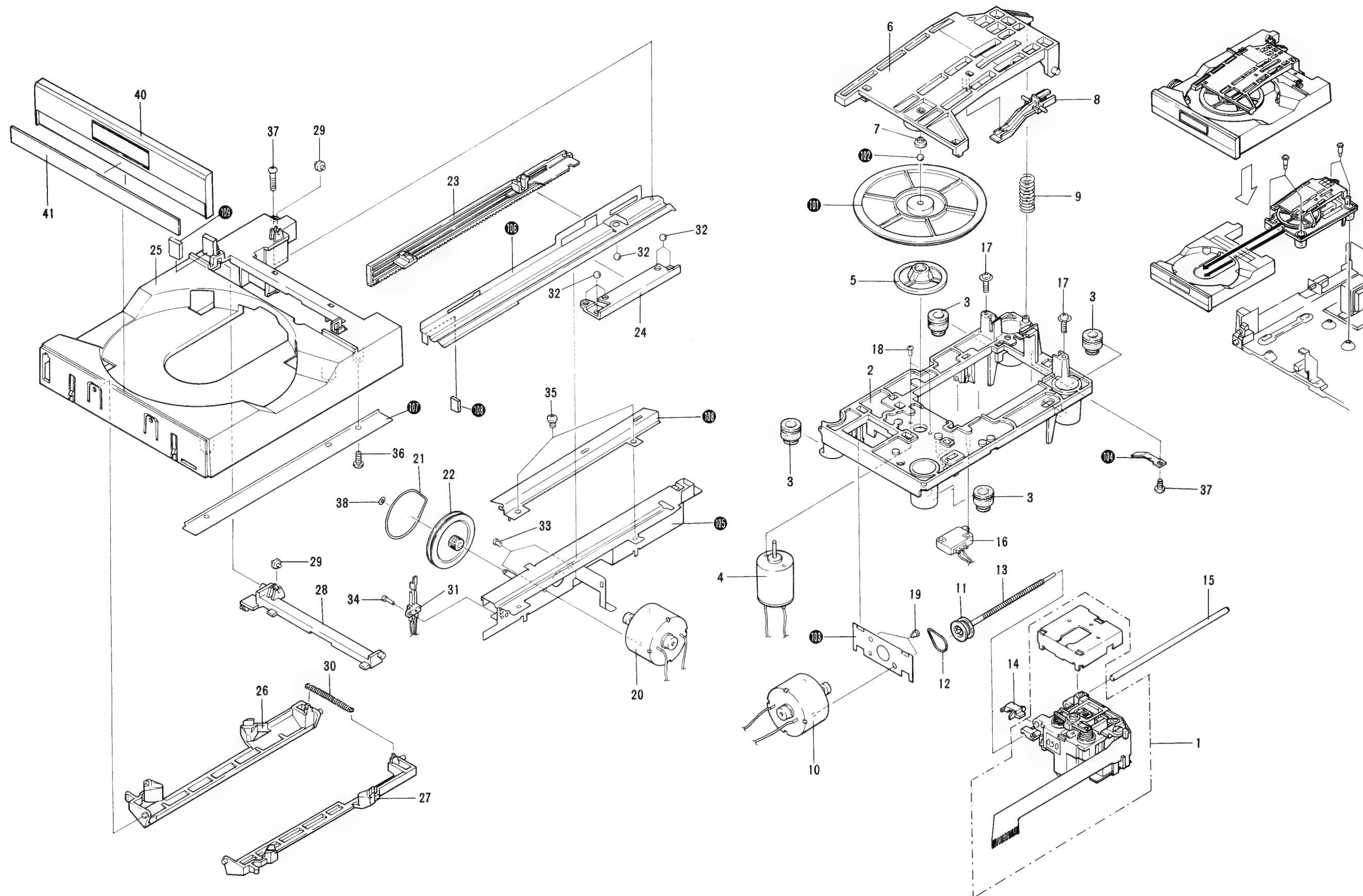
- Parts without part number cannot be supplied.
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your Parts Stock Control, the fast moving items are indicated with the marks **★★** and **★**.  
**★★ GENERALLY MOVES FASTER THAN ★**  
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

## Parts List of Exterior

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PWM-215	Function board assembly		30.	BBZ30P060FZK	Screw
	2.	XWM-216	Main board assembly		31.	BBZ40P060FMC	Screw
	3.	PAN-097	Front panel (D)		32.	PMZ30P060FMC	Screw
	4.	PAM-178	Window (C)		33.	FBT40P080FZK	Screw
	5.	PNY-388	Name plate		34.	PPZ26P060FZK	Screw
	6.	PAN-079	Plate	★	35.	PTT-233	Power Transformer (120V)
	7.	PNY-368	Filter		36.	PDG-046	AC Power cord
	8.	PNY-450	Function panel (D)		37.	CM-22	Strain relief
	9.	PAC-236	Knob cap (A) (PLAY)		38.	PKN-003	AC Socket (AC OUTLETS)
	10.	PAC-238	Knob cap (A) (PAUSE)		39.	PWX-096	Remote control reception
	11.	PAC-240	Knob cap (STOP)		101.		Display plate
	12.	PAC-242	Knob cap (A) (TRACK)		102.		Base
	13.	PAC-244	Knob cap (B) (TRACK)		103.		Rear base
	14.	PAC-246	Knob cap (A) (MANUAL)		104.		Front angle (A)
	15.	PAC-248	Knob cap (B) (MANUAL)		105.		Front angle (B)
	16.	PAC-250	Knob cap (PROGRAM)		106.		Front angle (C)
	17.	PNY-397	Lens		107.		Switch angle
	18.	PAC-270	Button (REPEAT)		108.		Slide guide
	19.	PAC-252	Button (OPEN/CLOSE)		109.		Foot
	20.	PAC-254	Button (A) (POWER)		110.		P.C.B. spacer
	21.	PNY-366	Joint (POWER)		111.		P. C. board holder
	22.	PPZ30P080FMC	Screw		112.		Headphone board assembly
	23.	PNA-225	Bonnet		113.		Primary board assembly
	24.	PBA-182	Screw		114.		Sub cord board assembly
	25.	PBM-012	Plastic rivet		115.		Absorber
	26.	PPZ30P150FMC	Screw		116.		Mount plate
	27.	PPZ30P080FZK	Screw		117.		Holder
	28.	BBZ30P060FMC	Screw				
	29.	BBZ30P080FZK	Screw				



# 6.2 MECHANISM ASSEMBLY



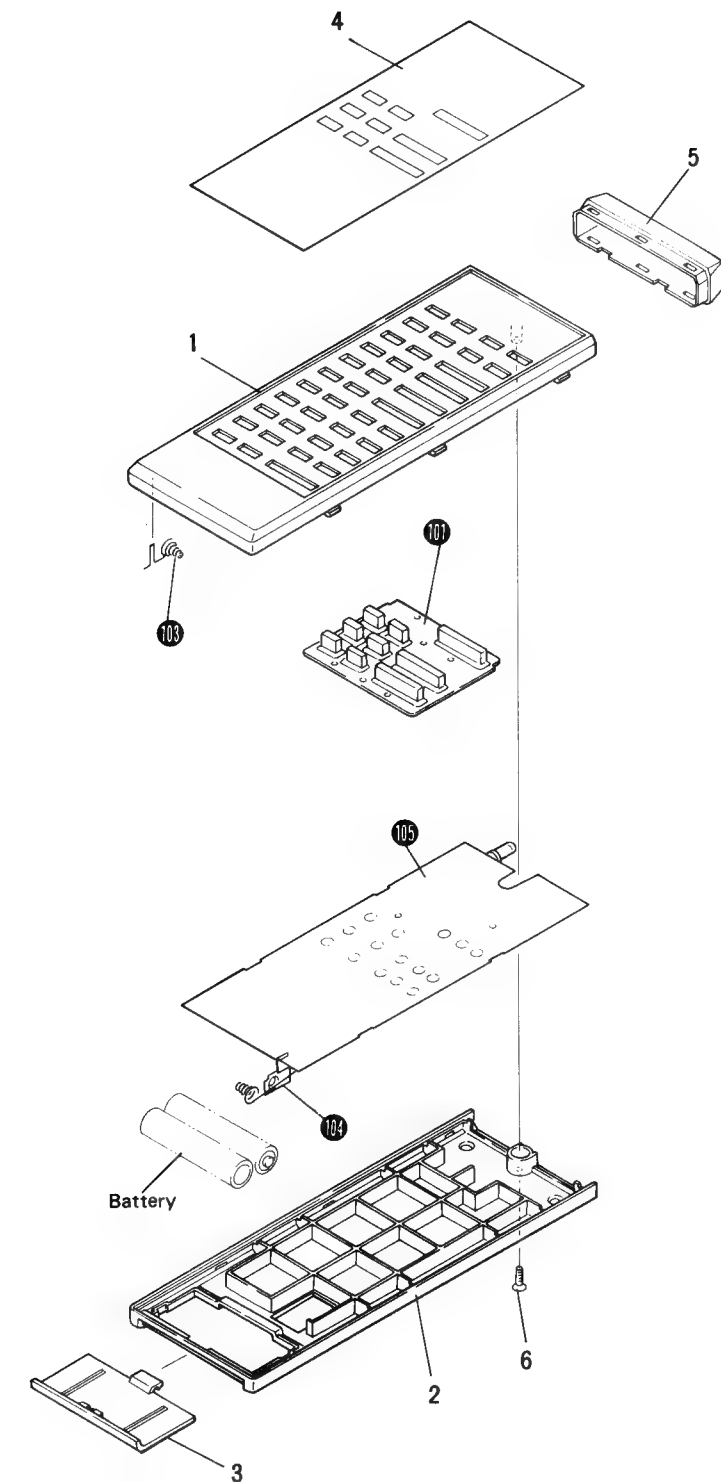
## Parts List of M

Mark	No.	P
	1.	P
	2.	P
	3.	P
★ ★	4.	P
	5.	P
	6.	P
	7.	V
	8.	P
	9.	P
★ ★	10.	P
★ ★	11.	P
★ ★	12.	P
	13.	P
	14.	P
	15.	P
★ ★	16.	P
	17.	P
	18.	P
	19.	P
★ ★	20.	P
★ ★	21.	P
	22.	P
	23.	P
	24.	P
	25.	P
	26.	P
	27.	P
	28.	P
	29.	P
	30.	P

## Parts List of Mechanism Assembly

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
★ ★	1.	PWY-004	Pickup assembly	★ ★	31.	PSN-003	Spring switch (CLMP: S102)
	2.	PNY-271	Mechanism chassis		32.	PBP-001	Steel ball 4φ
	3.	PEB-293	Floating rubber		33.	PMZ26P040FMC	Screw
	4.	PXM-147	Spindle motor		34.	PMZ20P060FMC	Screw
	5.	PNY-272	Disc table		35.	BBZ30P060FMC	Screw
★ ★	6.	PNY-352	Clamper holder	36.	PPZ30P080FMC	Screw	
	7.	VNL-268	Receptacle	37.	...	...	
	8.	PNY-354	Clamper lever	38.	WT25D047D025	Washer	
	9.	PBH-422	Clamper spring	39.	BBZ30P080FZK	Screw	
	10.	PYY-504	Motor assembly (CARRIAGE)	40.	PNY-388	Name plate [Black]	
★ ★	11.	PNX-449	Motor pulley		PNY-403	Name plate [Silver]	
★ ★	12.	PEB-294	Belt	41.	PAN-079	Plate	
	13.	PLB-271	Drive worm				
	14.	PNY-355	Nut	101.		Clamper	
	15.	PLB-272	Guide bar	102.		Steel ball	
★ ★	16.	PSH-007	Slide switch (INSIDE: S101)	103.		Motor base	
	17.	iPZ30P080FMC	Screw	104.		Guide bar stopper	
	18.	PMZ20P040FMC	Screw	105.		Loading base unit	
	19.	PMZ26P040FMC	Screw				
	20.	PYY-504	Motor assembly (LOADING)	106.		Slide base	
★ ★	21.	PEB-297	Belt	107.		Slide plate	
	22.	PNY-379	Gear	108.		Stop rubber	
	23.	PNY-380	Rack	109.		Cushion (2.5)	
	24.	PNY-381	Retainer				
	25.	PNY-406	Tray				
	26.	PNY-383	Disc lever (L)				
	27.	PNY-384	Disc lever (R)				
	28.	PNY-385	Drive lever				
	29.	PNY-386	Roller				
	30.	PBH-423	Disc lever spring				

## 6.3 REMOTE CONTROL UNIT (PWW-003)



## Parts List of Remote Control Unit

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PNY-434	Case (A)	101.			Rubber sheet
	2.	PNY-435	Case (B)	102.			...
	3.	VNK-548	Cover	103.			Spring
	4.	PAN-108	Plate	104.			Spring
	5.	PNY-436	Filter	105.			P.C. board
	6.	CRZ20P080FZK	Screw				

## A

## B

## C

## D

[illegible]

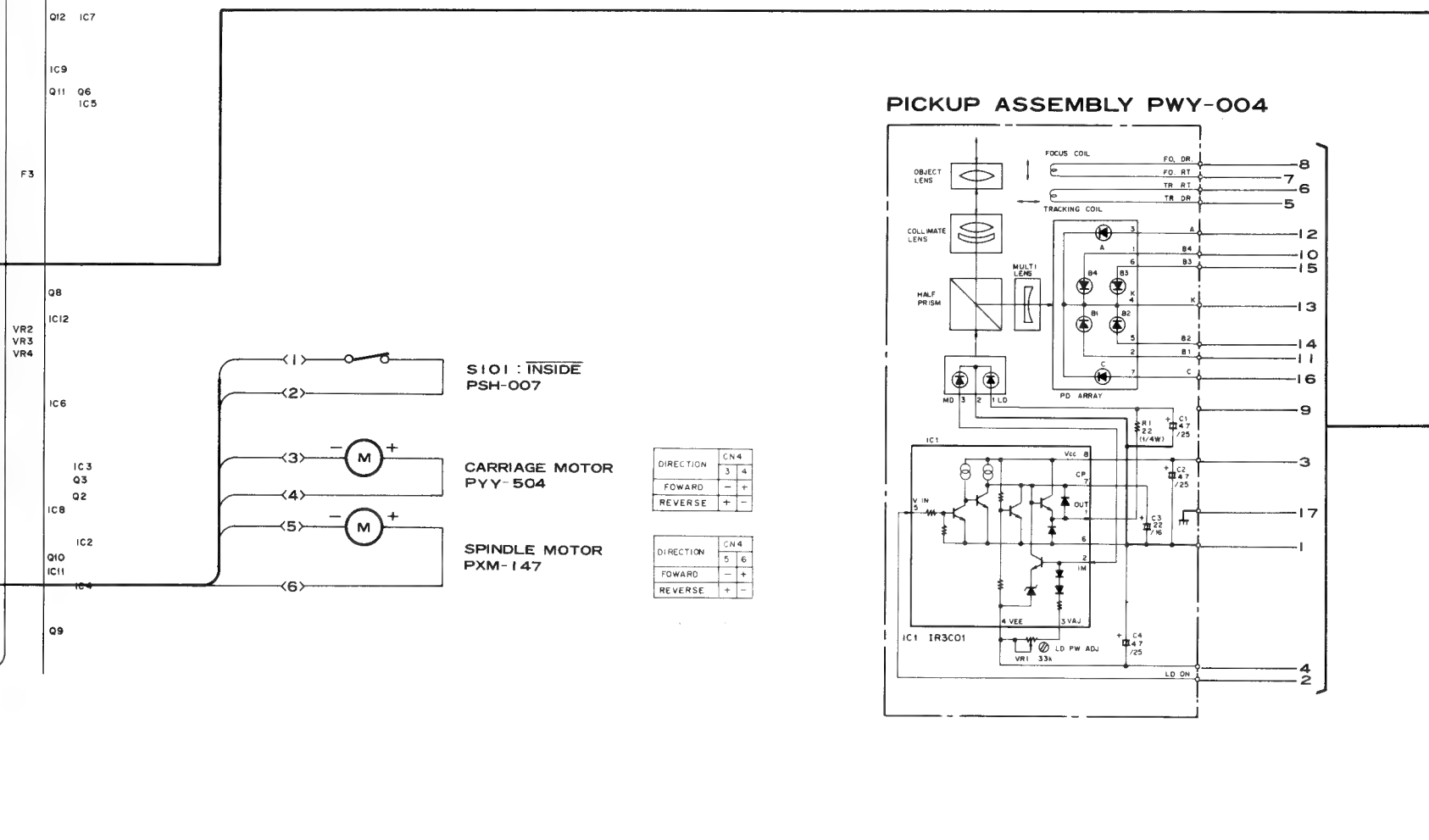
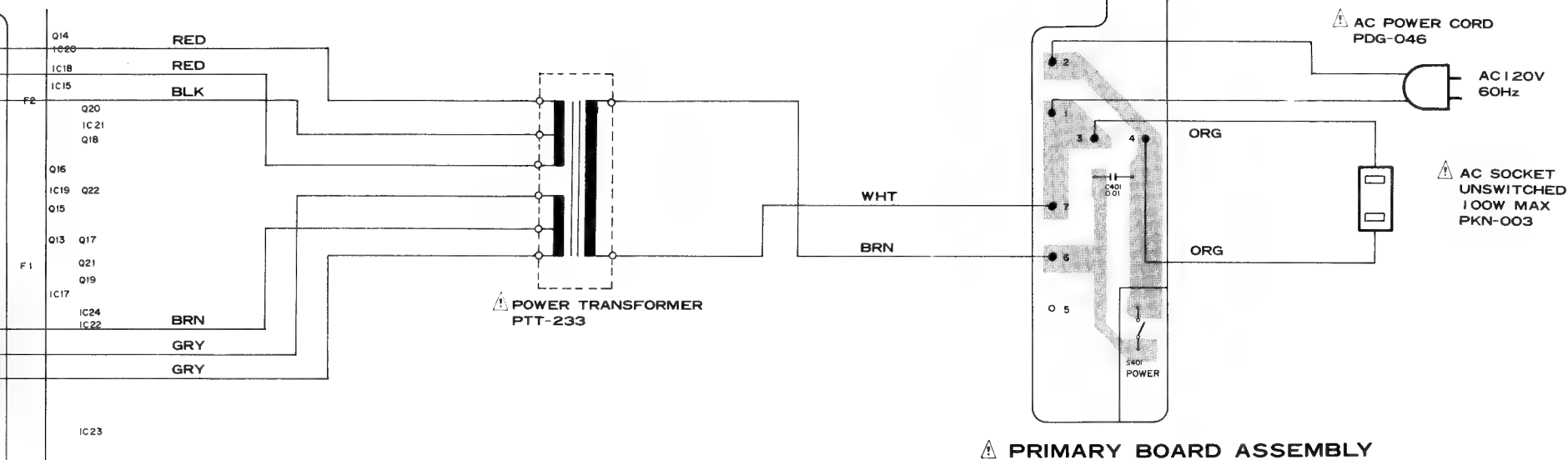
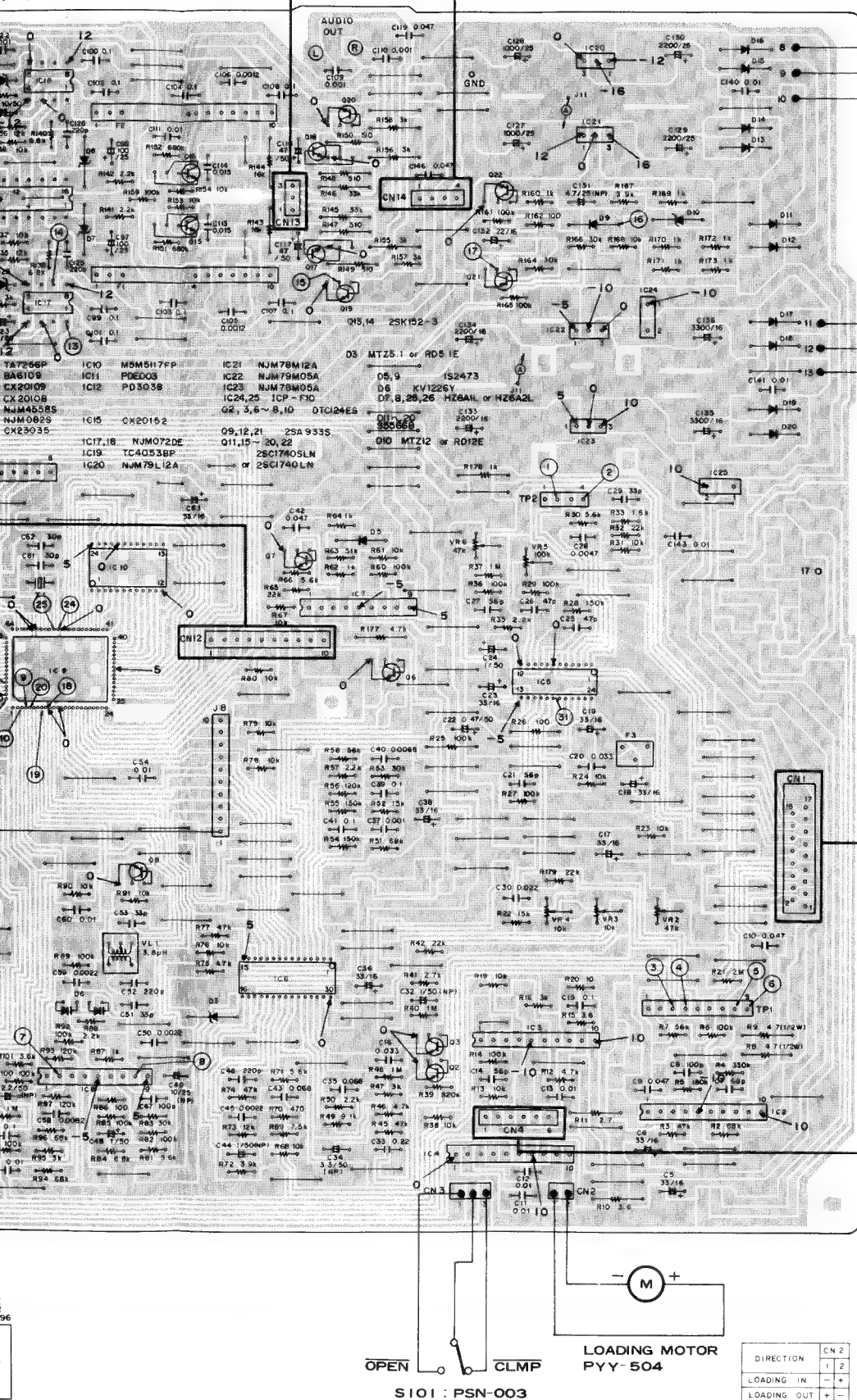
REMOTE SENSOR PWX-096

+5V

SIGNAL

GND





## 7.2 SCHEMATIC DIAGRAM

### NOTE:

#### 1. RESISTORS:

Indicated in  $\Omega$ ,  $\frac{1}{2}W$ ,  $\frac{1}{4}W$ ,  $\pm 5\%$  tolerance unless otherwise noted k; k $\Omega$ , M; M $\Omega$ , (F);  $\pm 1\%$ , (G);  $\pm 2\%$ , (K);  $\pm 10\%$ , (M);  $\pm 20\%$  tolerance

#### 2. CAPACITORS:


Indicated in capacity ( $\mu F$ )/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.


#### 3. VOLTAGE

: DC voltage (V) at no input signal

#### 4. OTHERS:

: Signal route.

: Adjusting point.

The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

\* marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

The waveforms at each measuring point indicated by the encircled numbers are given on pages 34 thru 37.

### SWITCHES:

#### MAIN BOARD ASSEMBLY

S1 : TEST

#### FUNCTION BOARD ASSEMBLY

S201 : OPEN / CLOSE

S202 : REPEAT

S203 :  (MANUAL SEARCH)

S204 :  (MANUAL SEARCH)

S205 : PROGRAM

S206 :  (TRACK SEARCH)

S207 :  (TRACK SEARCH)

S208 : STOP / CLEAR

S209 : PLAY

S210 : PAUSE

#### PRIMARY BOARD ASSEMBLY

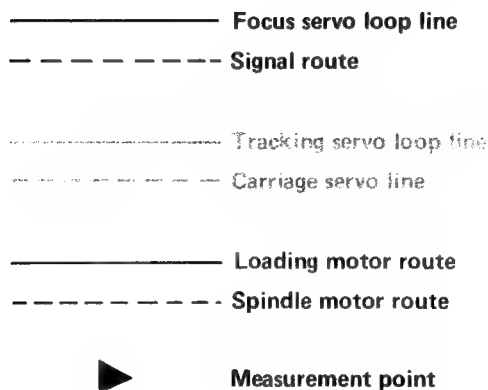
S401 : POWER ON - OFF

#### OUTSIDE OF P.C. BOARD ASSEMBLY

S101 : INSIDE

S102 : CLAMP CLAMP - OPEN

The underlined indicates the switch position.



● List of Symbols

Symbol	Signal Source	Signal Name	Function
A			Tracking signal lead code detector
A0~A10	IC9-38~48	Address line	
APCG	IC1-6	APC GND	
B1~B4			Output from 1/4 divider detectors used to detect RF and focus signals
BCLK	IC9-76	Bit clock	
C			Tracking signal end code detector
C·OUT	IC6-6	Counter out	Track count signal pulse
C1F1	IC9-62	Error flag	Flags indicating when decoder LSI is correcting errors
C1F2	IC9-63	Error flag	
C2F1	IC9-64	Error flag	
C2F2	IC9-65	Error flag	
CA·DR	IC3-2	Carriage drive	Carriage motor drive output
CLK	IC12-27	Clock	IC6 and IC9 control data (serial) clock
CLMP	S102	Clamp	Disc tray status (L: closed, H: open or moving)
CRCF	IC9-20		Sub-code Q error detection result output (synchronized with SCOR signal)
CS	IC9-50	Chip select	RAM activator control signal
D1~D8	IC9-37~34 32~29	Data line	RAM data line
DATA	IC9-78	Data	DAC playback signal data (serial)
DEMP	IC12-24	De-emphasis	De-emphasis on/off signal (L: de-emphasis ON)
DIRC	IC12-13	Direct	Control signal involved in single track jumping (control only while signal is at L level)
EXCK	IC9-21	External clock	External clock input
FG DW	IC12-15	Focus gain down	Control signal for reducing focus servo gain
FO·DR	IC2-2	Focus drive	Focus actuator drive signal
FO·ER	IC5-16	Focus error	Focus error signal
FO·IN	TP1-6	Focus loop in	Focus servo gain adjustment input
FO·OT	TP1-1	Focus loop out	Focus servo gain adjustment output
FO·RT	TR1-8	Focus	Focus actuator drive current detector
FOK	IC5-1	Focus OK	H level output to indicate that "in focus" status is set when RF signal is obtained
GFS	IC9-28	GFS	Frame sync lock status output (H: locked)
GND		GND	
INSD	S101	Inside	Detector signal indicating that pick-up has reached inside track
K			
KD0~KD5	IC11 9~12 15, 17	Key data	Key on/off matrix encoded data
K $\overline{S}$	IC201-11	Key st	Output indicating that key has been pressed (L output when key is ON)
L·IN	IC12-26	Loading in	Loading-in control signal
L·OUT	IC12-28	Loading out	Loading-out control signal
LD ON	IC12-10	Laser diode	Laser diode switching signal (H: diode ON)
LOAD +	IC4-2		Loading motor drive voltage output
LOAD -	IC4-10		
LRCK	IC9-80	LR clock	Clock (44.1kHz) for switching decoder (DAC) left/right channels

\*1: Also used in 10-track jumping in PD-6010

Symbol	Signal Source	Signal Name	Function
MIRR	IC5-18	Mirror	Pitless side (mirror surface) detector signal (pitless side: H)
MRIH	IC12-14	Mirror inhibit	Control signal which inhibits transfer of MIRR signal from IC5 to IC9
MUTE	IC12-19	Muting	IC9 digital mute control signal
OPEN	S102	Open	Output from switch which detects when disc tray is open (open: L)
RAOV	IC9-57	RAM overflow	Output signal generated when RAM area overflow occurs (overflow: H)
RESET	Q11-C	Reset	Power ON reset signal
RFCK	TP4-7(IC9, 25)	Read frame clock	Standard frame clock signal (7.35kHz)
RMKS	IC12-58	Remote control key	Remote control key strobe passed from remote control decoder (IC11) to main microprocessor (IC12)
SBS0	IC9-22		Sub-code serial output
SCK	IC12-55	Serial clock	FL display data transfer clock
SCLK	IC13-4	System clock	Audio playback system clock
SC0R	IC9-24		Sub-code sync
SD	IC12-56	Serial data	Control signal passed to FL control CPU
SENS	IC6-5		Detector output bus from IC6 & IC9
SP·DR	CN4-5	Spindle drive	Spindle motor drive output
SP·RT	CN4-6	Spindle return	Spindle motor drive current detector
SRES	IC12-57	Serial reset	Key/display/microprocessor reset signal
STS	IC201-21	Status	Display data "ready to send"
SUB0	IC9-23	Sub-code Q	Sub-code Q output (address and other data)
TR·DR	IC2-8	Tracking drive	Tracking actuator drive signal
TR·ER	IC5-17	Tracking error	Tracking servo error output
TR·IN	TP1-7	Tracking loop in	Tracking servo gain adjustment input
TR·OT	TP1-2	Tracking loop out	Tracking servo gain adjustment output
TR·RT	TP1-9	Tracking return	Tracking actuator drive current detector
WCLK	IC13-21		Digital filter 88.2kHz strobe signal input
WDCK	IC9-79		Digital filter 88.2kHz strobe signal output
WE	IC9-49	Write enable	RAM write enable
WFCK	IC9-25	Write from clock	Frame clock signal made from data (frame sync. lock: 7.35kHz)
XLT	IC12-16		Servo and decode IC serial data latch clock pulse signal

● WAVE FORM

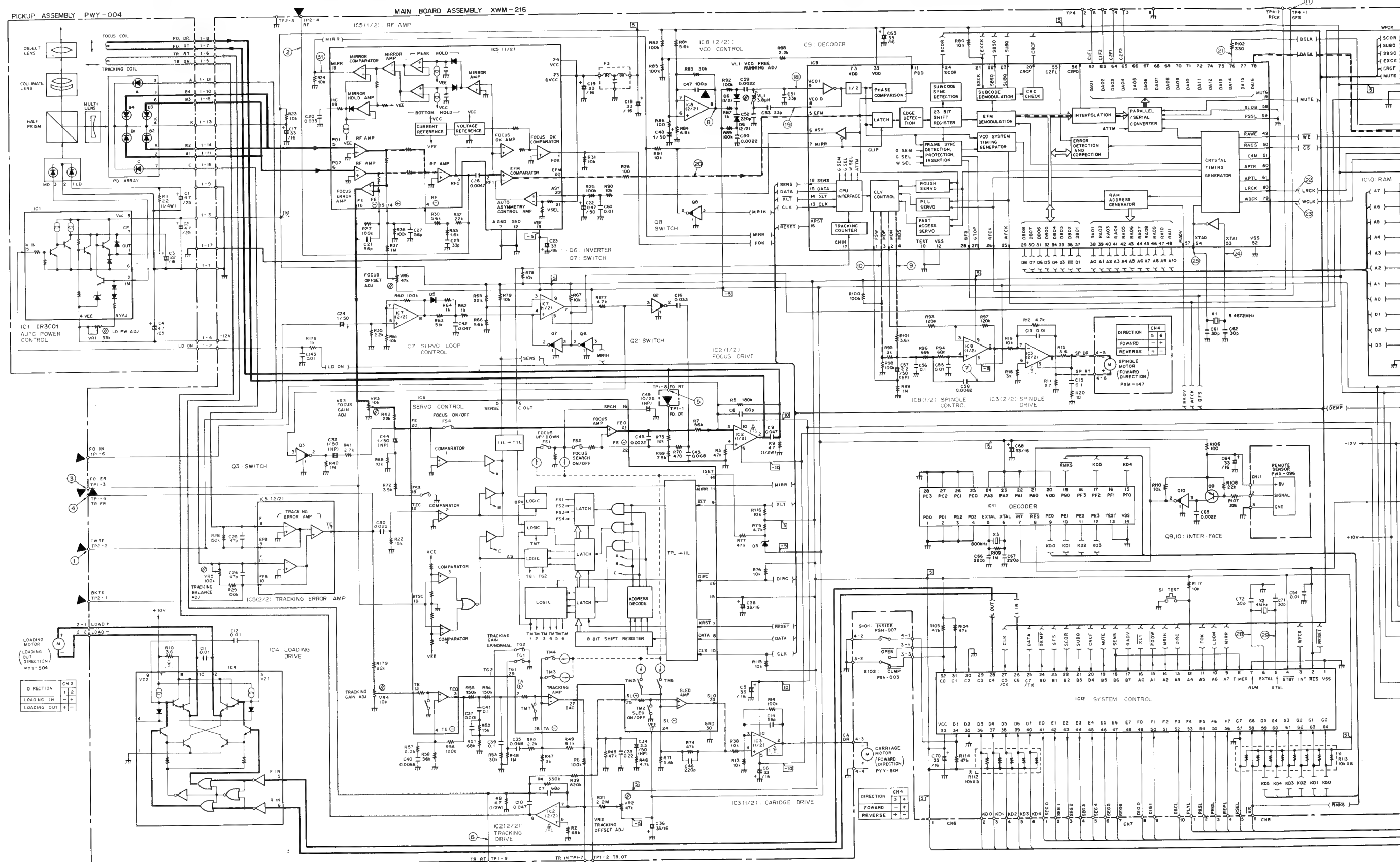
Note: The waveform voltage and time values are general guides only.

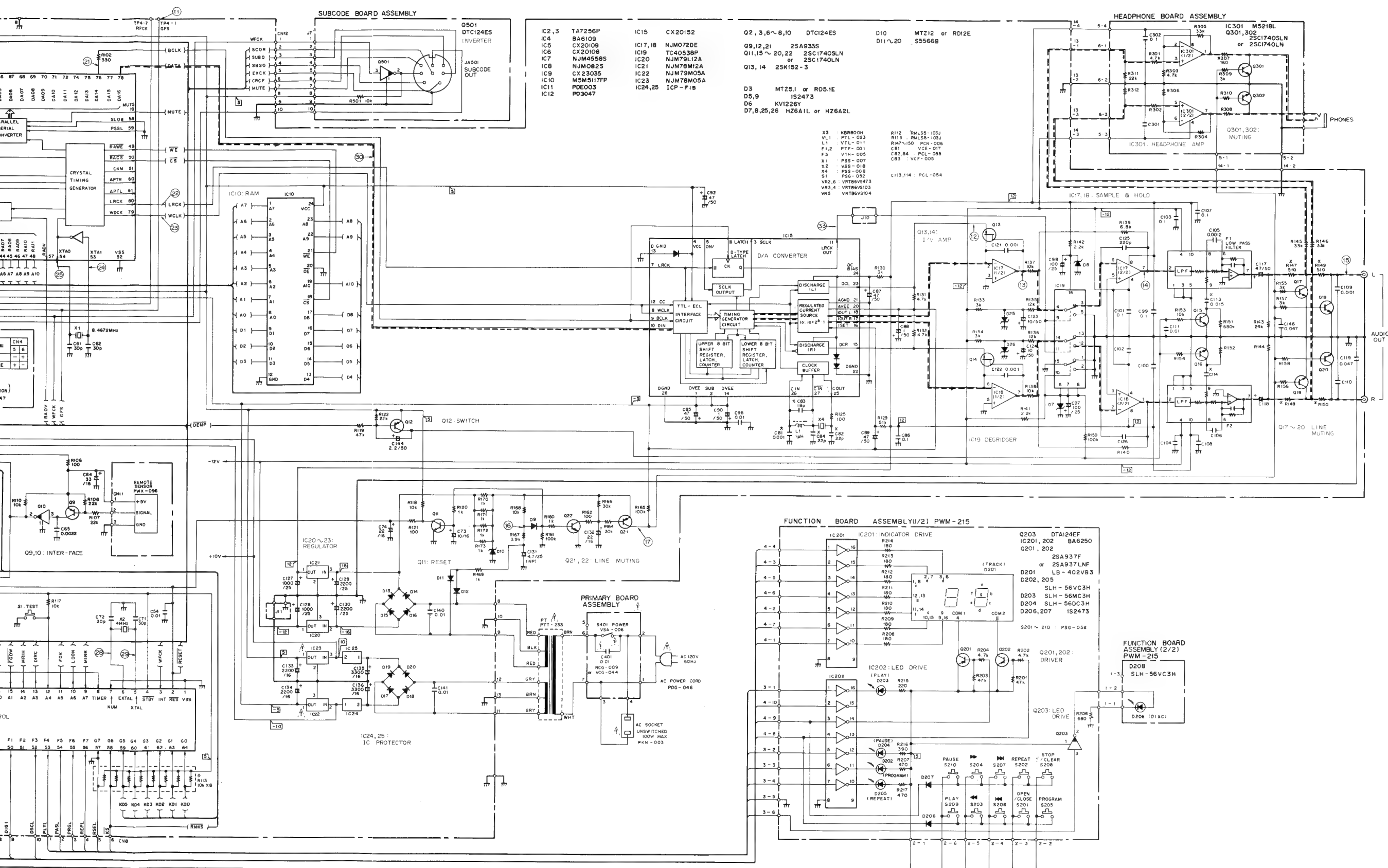
	PLAY	SEARCH
1		
2		
3		
4		
5		
6		
7		
8		
9		

	PLAY	SEARCH
10		
11		
12		
13		
14		
15		
16		

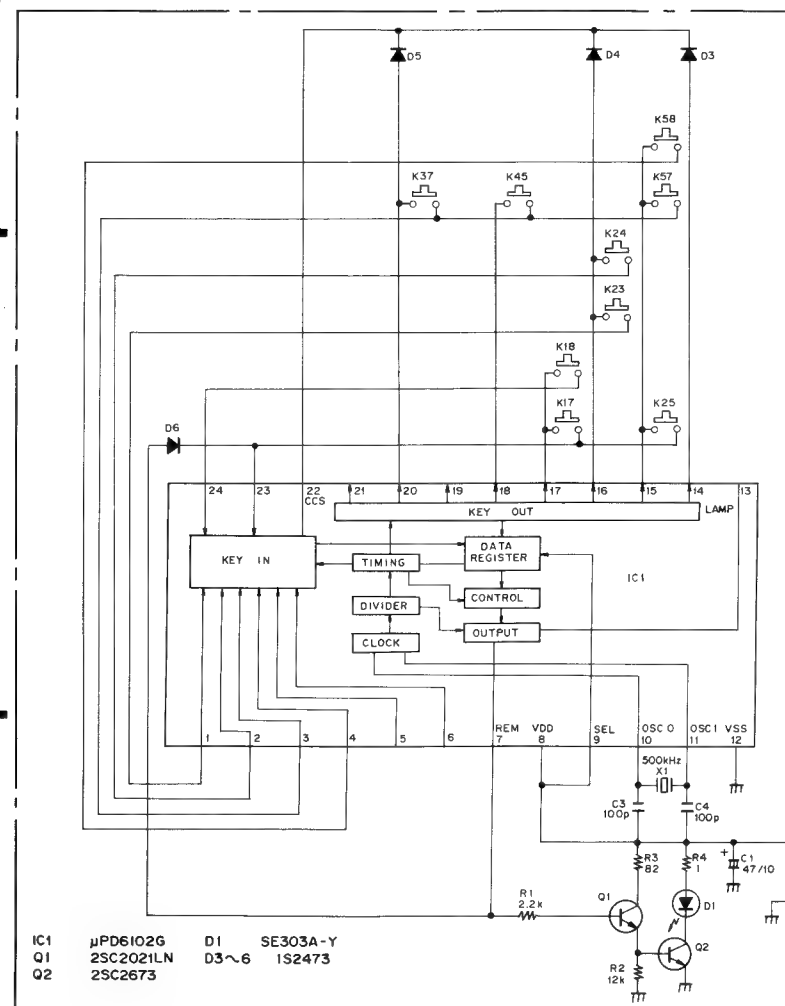
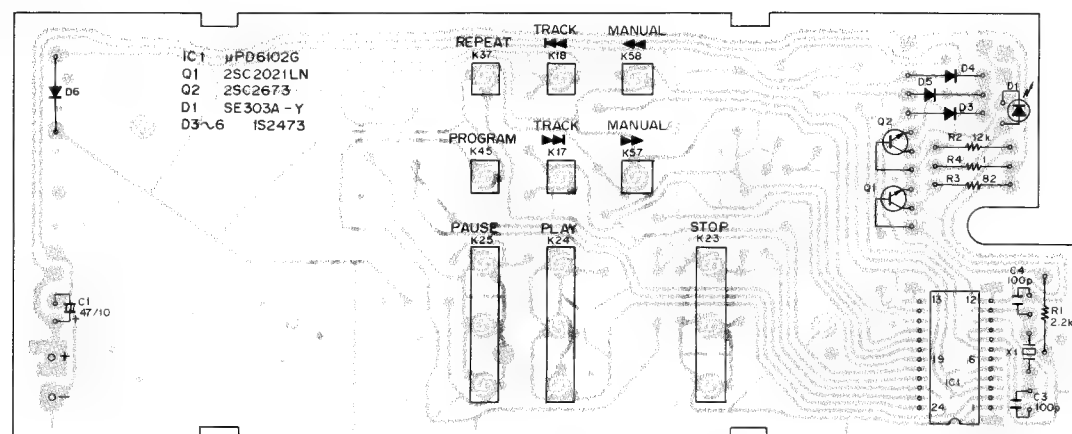
	POWER ON	POWER OFF
17		







## 7.3 REMOTE CONTROL UNIT



1. RESISTORS:  
Indicated in  $\Omega$ ,  $\frac{1}{4}W$ ,  $\frac{1}{2}W$ ,  $\frac{3}{4}W$ ,  $\pm 5\%$  tolerance unless otherwise noted k; k $\Omega$ , M; M $\Omega$ , (F);  $\pm 1\%$ , (G);  $\pm 2\%$ , (K);  $\pm 10\%$ , (M);  $\pm 20\%$  tolerance

2. CAPACITORS:  
Indicated in capacity ( $\mu F$ )/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. OTHERS:

Signal route.  
Adjusting point.

The mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

\* marked capacitors and resistors have parts numbers.

SWITCHES:

K17 : (TRACK SEARCH)  
K18 : (TRACK SEARCH)  
K23 : STOP  
K24 : PLAY  
K25 : PAUSE

K37 : REPEAT  
K45 : PROGRAM

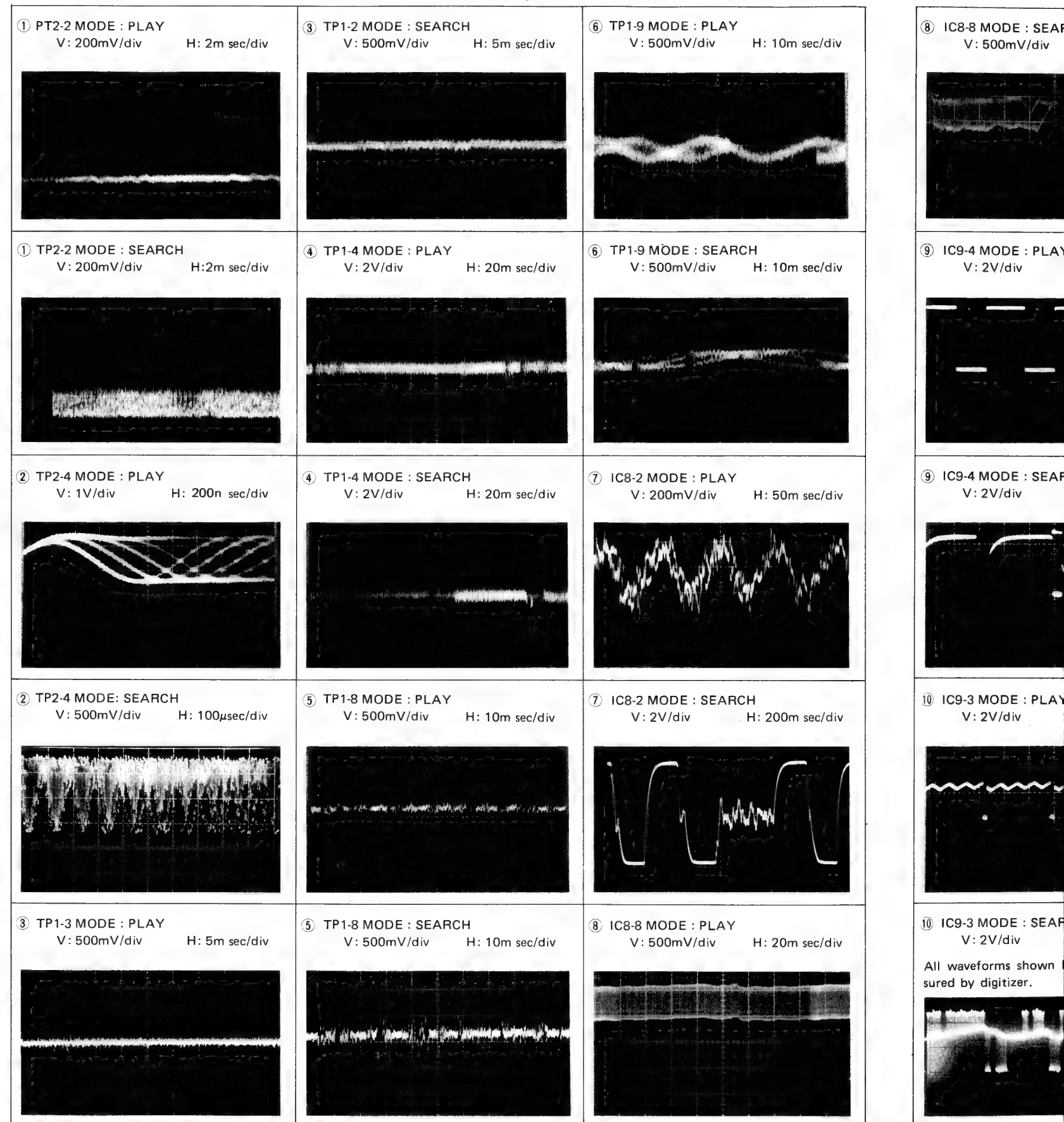
K57 : (MANUAL SEARCH)  
K58 : (MANUAL SEARCH)

The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

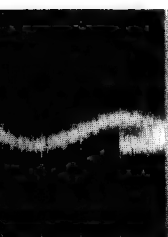
## Wave Form

NOTE: The encircled numbers denote measuring points in the circuit and pattern diagrams.

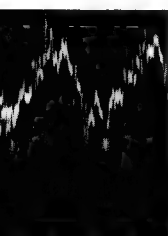


All waveforms shown measured by digitizer.

H: 10m sec/div

CH  
H: 10m sec/div

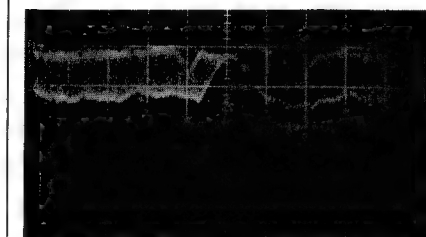
H: 50m sec/div

CH  
H: 200m sec/div

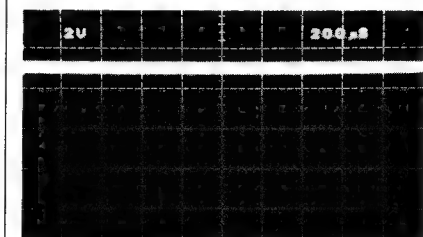
H: 20m sec/div



⑧ IC8-8 MODE : SEARCH  
V: 500mV/div H: 20m sec/div



⑪ TP4-1 MODE : PLAY  
V: 2V/div H: 20m sec/div



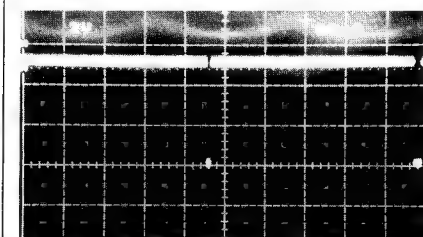
⑭ IC17-7 MODE : PLAY  
V: 2V/div H: 100μsec/div



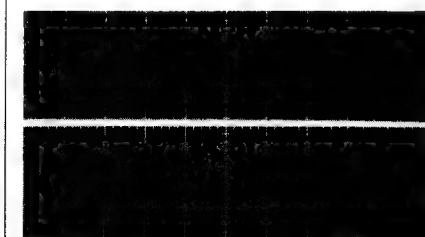
⑨ IC9-4 MODE : PLAY  
V: 2V/div H: 50μsec/div



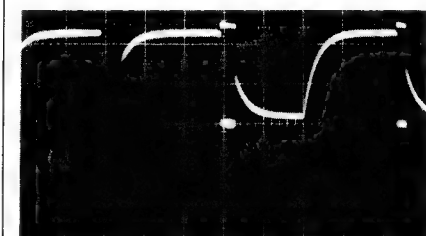
⑪ TP4-1 MODE : SEARCH  
V: 2V/div H: 200μsec/div



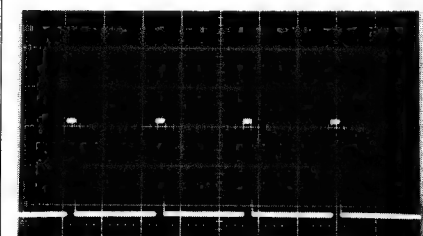
⑭ IC17-7 MODE : SEARCH  
V: 2V/div H: 100μsec/div



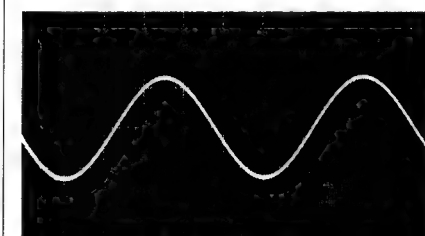
⑨ IC9-4 MODE : SEARCH  
V: 2V/div H: 100m sec/div



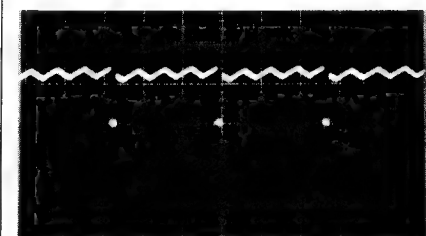
⑫ IC15-23 MODE : PLAY or SEARCH  
V: 2V/div H: 5μsec/div



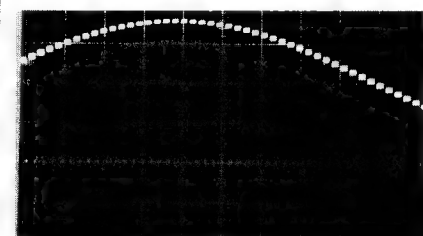
⑮ OUT L MODE : PLAY  
V: 2V/div H: 200μsec/div



⑩ IC9-3 MODE : PLAY  
V: 2V/div H: 200μsec/div



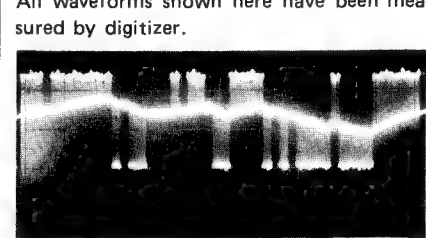
⑬ IC17-1 MODE : PLAY  
V: 2V/div H: 50μsec/div



⑮ OUT L MODE : SEARCH  
V: 2V/div H: 200μsec/div

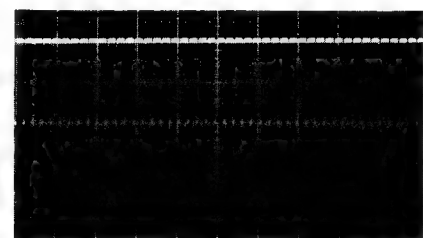


⑩ IC9-3 MODE : SEARCH  
V: 2V/div H: 10m sec/div

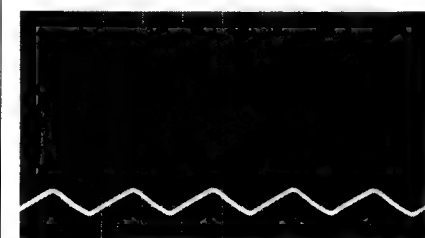


All waveforms shown here have been measured by digitizer.

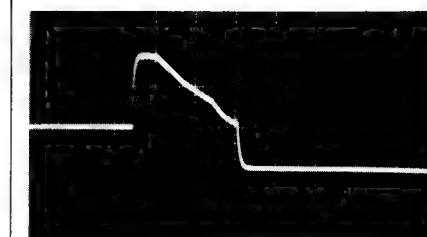
⑬ IC17-1 MODE : SEARCH  
V: 2V/div H: 50μsec/div



⑯ D9-anode MODE : PLAY or SEARCH  
V: 2V/div H: 5m sec/div



⑰ Q21-C POWER ON  
V: 5V/div H: 1 sec/div

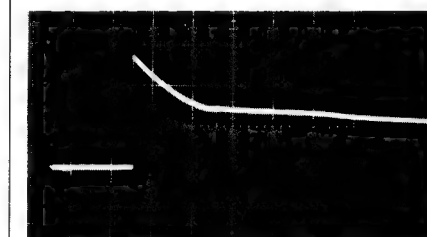


⑳ IC9-76 MODE : STOP  
V: 2V/div H: 200m sec/div

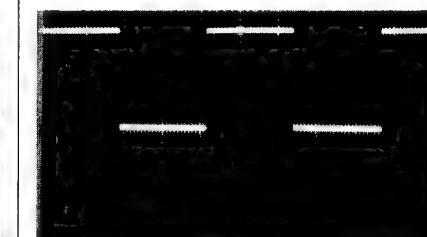


⑳

⑰ Q21-C POWER OFF  
V: 5V/div H: 500m sec/div

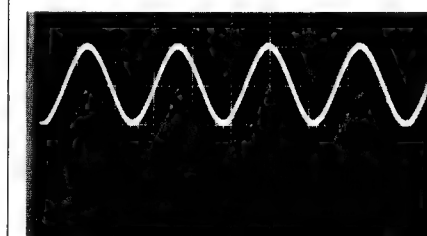


㉑ IC9-80 MODE : STOP  
V: 2V/div H: 5μsec/div



㉑

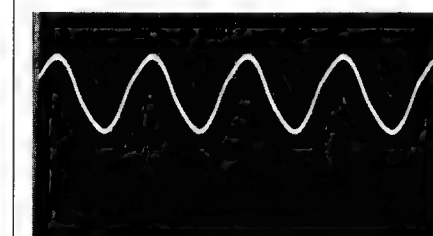
⑱ IC9-9 MODE : STOP  
V: 2V/div H: 50m sec/div



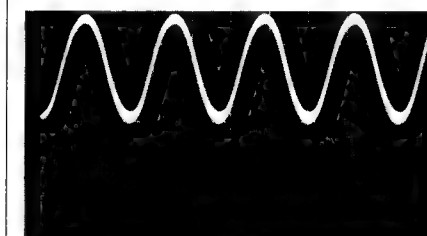
㉒ IC9-79 MODE : STOP  
V: 2V/div H: 5μsec/div



㉓ IC12-6 MODE : STOP  
V: 2V/div H: 100n sec/div



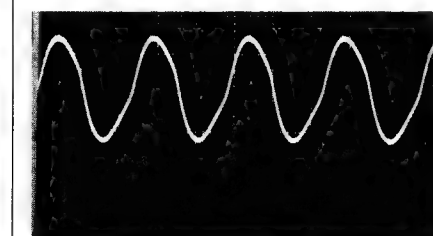
⑲ IC9-8 MODE : STOP  
V: 1V/div H: 50m sec/div



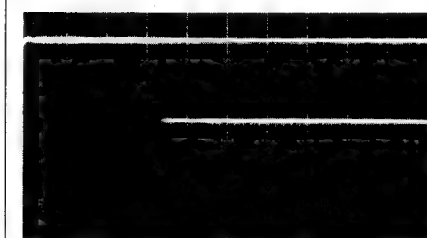
㉔ IC9-53 MODE : STOP  
V: 2V/div H: 50n sec/div



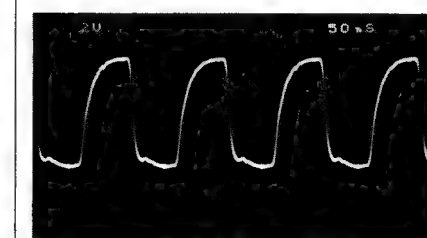
㉕ IC12-5 MODE : STOP  
V: 2V/div H: 100n sec/div



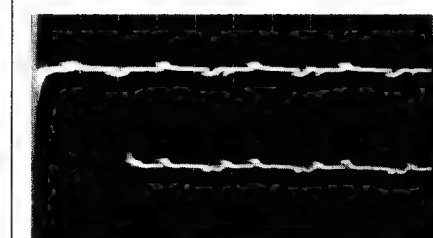
㉖ IC9-5 MODE : PLAY  
V: 2V/div H: 200 sec/div

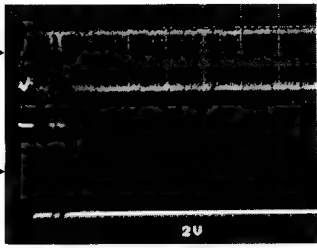
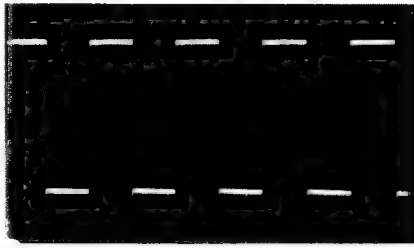


㉗ IC9-54 MODE : STOP  
V: 2V/div H: 50n sec/div



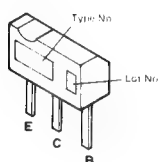
㉘ IC15-10 MODE : PLAY  
V: 2V/div H: 200n sec/div



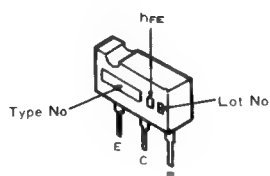
<p>③① IC 5-18 MODE : STOP V: 2V/div 2m sec/div</p>  <p>IC5-3 (RF)</p> <p>IC5-18 (MIRR)</p> <p>2V</p>	<p>③③ IC15-11 MODE : STOP V: 2V/div H: 5μsec/div</p> 	<p>③⑤</p>
<p>③②</p>	<p>③④</p>	<p>③⑥</p>

## External Appearance of Transistors and ICs

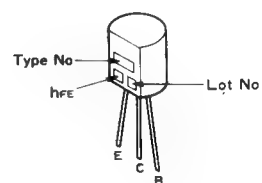
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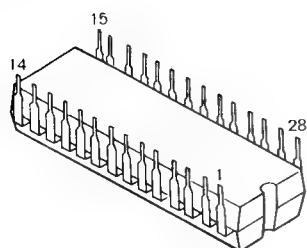
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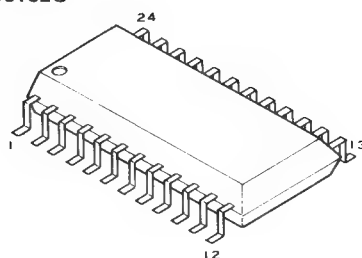
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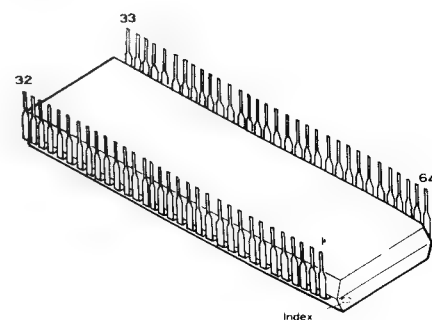
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μPD6102G

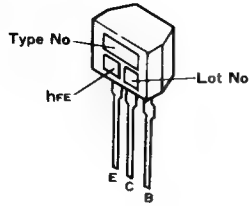


PD3047

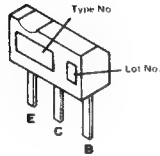




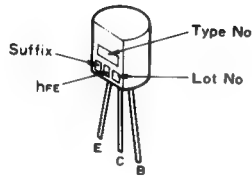
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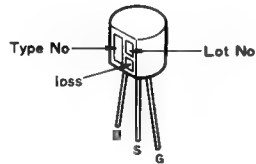
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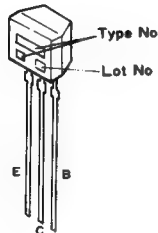
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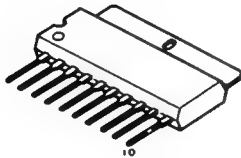
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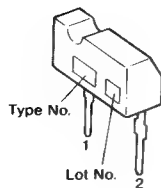
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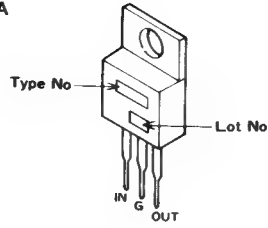
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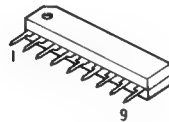
ICP-F15



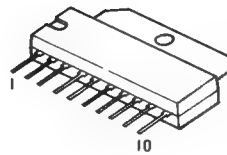
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NJM78M12A



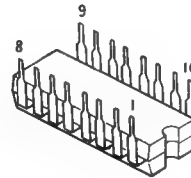
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NJM082S



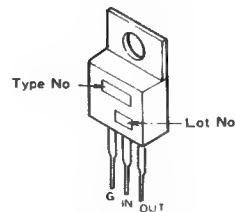
TA7256P



BA6250  
TC4053BP



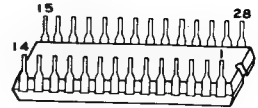
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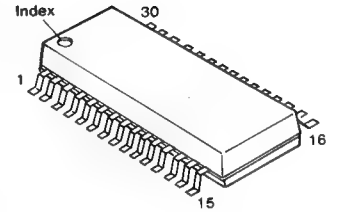
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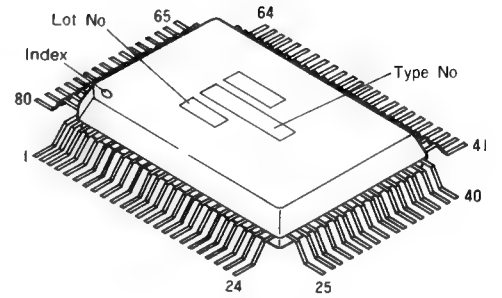
CX20152



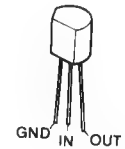
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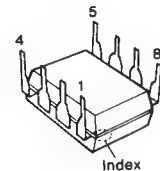
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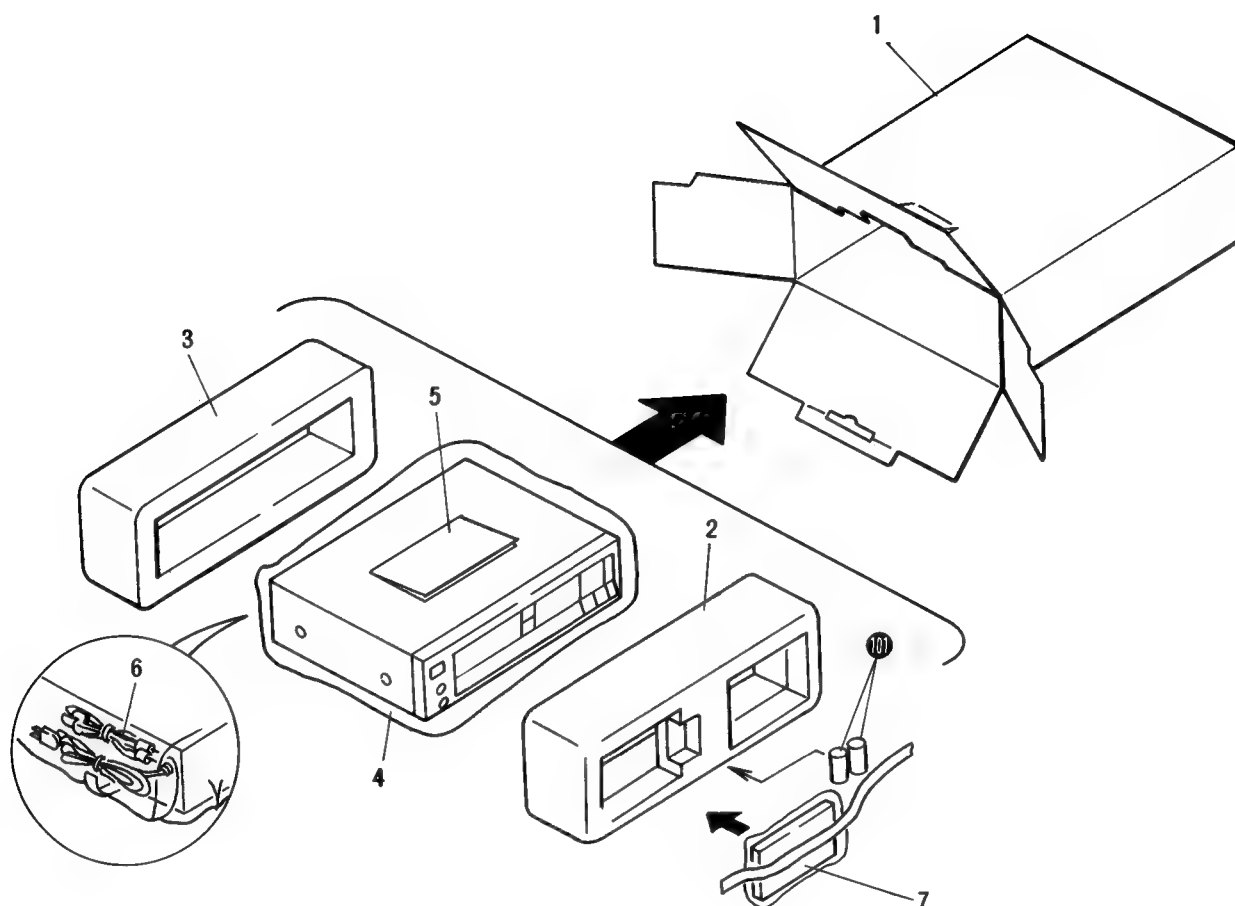
NJM072DE



NJM79L12A



## 8. PACKING



### Parts List of Packing

Mark	No.	Part No.	Description
	1.	PHH-273	Packing case
	2.	PHC-111	Protector (F)
	3.	PHC-114	Protector (R)
	4.	Z22-006	Polyethylene sheet
	5.	PRB-297	Operating instructions (English)
	6.	PDE-321	Connection cord
	7.	PWW-003	Remote control unit
	101.		Battery

## 9. ELECTRICAL PARTS LIST

### NOTES:

- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω    56 × 10<sup>1</sup>    561 ..... RD½PS 561 J


47kΩ    47 × 10<sup>3</sup>    473 ..... RD½PS 473 J

0.5Ω    0R5 ..... RN2H 0R5 K

1Ω    010 ..... RS1P 010 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ    562 × 10<sup>1</sup>    5621 .... RN½SR 5621 F







- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

- For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.

★★ GENERALLY MOVES FASTER THAN ★



This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

### Miscellaneous

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
	Main board assembly	XWM-216	 ★★	IC24, IC25	ICP-F15
	Headphone board assembly		 ★★	IC2, IC3	TA7256P
	Primary board assembly		★★	IC19	TC4053BP
	Sub-cord board assembly		★★	Q2, Q3, Q6 – Q8, Q10	DTC124ES
	Function board assembly	PWM-215	★★	Q9, Q12, Q21	2SA933S
			★★	Q11, Q15 – Q20, Q22	2SC1740SLN (2SC1740LN)
	★ Power transformer (120V)	PTT-233	★★	Q13, Q14	2SK152
	AC power cord	PDG-046	★	D5, D9	1SS254
	AC socket (AC OUTLETS)	PKN-003	★	D3	MTZ5.1 (RD5.1E)
★★	Motor assembly (LOADING)	PYY-504	★	D10	MTZ12 (RD12E)
★★	Motor assembly (CARRIAGE)	PYY-504			
★★	Spindle motor	PXM-147			
★★	S101 Slide switch (INSIDE)	PSH-007	★	D6	KV1226Y
★★	S102 Spring switch (CLMP)	PSN-003	★	D7, D8, D25, D26	HZ6A1L/2L
	Pickup assembly	PWY-004	★	D11 – D20	S5566B

### Main Board Assembly (XWM-216)

#### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC9	CX23035
★★	IC6	CX20108
★★	IC5	CX20109
★★	IC15	CX20152
★★	IC12	PD3047
★★	IC11	PDE003
★★	IC10	M5M5117FP
★★	IC4	BA6109
★★	IC17, IC18	NJM072DE
★★	IC8	NJM082S
★★	IC21	NJM78M12A
	★★ IC23	NJM78M05A
★★	IC20	NJM79L12A
	★★ IC22	NJM79M05A
★★	IC7	NJM4558S

#### SWITCH

Mark	Symbol & Description	Part No.
★★	S1 Tact switch (TEST)	PSG-052

#### COILS AND FILTERS

Mark	Symbol & Description	Part No.
	VL1 VCO coil 3.8μH (8.6436MHz)	PTL-023
	L1 OSC coil 1μH	VTL-011
	F1, F2 Low pass filter	PTF-001
	F3 EMI filter	VTH-005



## CAPACITORS

Mark	Symbol & Description	Part No.
	C22	CEAR47M50
	C24, C88, C90	CEA010M50
	C123, C124	CEA100M50
	C74, C132	CEA220M16
	C5, C6 C17 – C19, C23, C36, C38, C63, C70	CEA330M16
	C85, C87, C89, C92, C117, C118	CEA470M50
	C97, C98	CEA101M25
	C73	CEA100M16
	C144	CEA2R2M50
	C127, C128	CEA102M25
	C129, C130	CEA222M25
	C133, C134	CEA222M16
	C135, C136	CEA332M16
	C32, C44	CEANP010M50
	C57	CEANP2R2M50
	C34	CEANP3R3M50
	C131	CEANP4R7M25
	C49	CEANP100M25
	C48	CEANL010M50
	C37	CQMA102J50
	C45, C50, C59, C65	CQMA222J50
	C28	CQMA472J50
	C40	CQMA682J50
	C58	CQMA822J50
	C55, C60	CQMA103J50
	C30	CQMA223J50
	C16, C20	CQMA333J50
	C42	CQMA473J50
	C35, C43	CQMA683J50
	C15, C39, C41, C56, C86, C99 – C104, C107, C108	CQMA104K50
	C33	CQMA224J50
	C125, C126	CQSF221J125
	C121, C122	CQSF102J125
	C105, C106	CQSF122J125
	C109, C110	CQSF102J125
	C113, C114	PCL-054
	C82, C84	PCL-055
	C81	VCE-017
	C83 (18p)	VCF-005
	C71, C72	CCDSL300J50
	C25, C26	CCDSL470J50
	C14, C21, C27	CCDSL560J50
	C7	CCDSL680J50
	C8, C47	CCDSL101J50
	C46, C66, C67	CCDSL221J50
	C51, C53	CCDUJ330J50
	C52	CCDUJ221J50
	C61, C62	CCDCH300J50
	C29	CCDCH330J50
	C11 – C13, C54, C96, C111, C140, C141, C143	CKDYF103Z50
	C10, C119, C146	CKDYF473Z50
	C9	CKDYX473M25

## RESISTORS

*NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

Mark	Symbol & Description	Part No.
★	VR3, VR4 Semi-fixed	VRTB6VS103
★	VR2, VR6 Semi-fixed	VRTB6VS473
★	VR5 Semi-fixed	VRTB6VS104
	R112	RMLS5-103J
	R113	RMLS8-103J
	R8, R9	RD1/2PM4R7J
	R129, R143, C144, R147 – R150	RDR1/4PM □□□J
	R81, R82, R84, R85	RN1/6PQ □□□□J
	Other resistors	RD1/6PM □□□J

## OTHERS

Mark	Symbol & Description	Part No.
	JA1 Terminal (AUDIO OUT)	VKB-006
★	X1 Crystal resonator (8.4672MHz)	PSS-007
★	X4 Crystal resonator (35.002MHz)	PSS-008
★	X2 Ceramic resonator	VSS-018
★	X3 Ceramic resonator	KBR800H

## Headphone Board Assembly

## SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC301	M5218L
★★	Q301, Q302	2SC1740SLN (2SC1740LN)

## CAPACITORS

Mark	Symbol & Description	Part No.
	C301, C302	CQMA104K50
	C303	CKDYF473Z50

## RESISTORS

*NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

Mark	Symbol & Description	Part No.
	All resistors	RD1/6PM □□□J

## OTHERS


Mark	Symbol & Description	Part No.
	JA301 Terminal (HEADPHONE)	PKN-004

## Primary Board Assembly

## SWITCH

Mark	Symbol & Description	Part No.
★ ★	S401 Power switch (POWER)	VSA-006

## CAPACITOR

Mark	Symbol & Description	Part No.
	C401	RCG-009 (VCG-044) (VCG-033)

## Sub-code Board Assembly

### SEMICONDUCTOR

Mark	Symbol & Description	Part No.
★ ★	Q501	DTC124ES

### RESISTOR

Mark	Symbol & Description	Part No.
	R501	RD1/6PM103J

### OTHERS

Mark	Symbol & Description	Part No.
	JA501 Socket (SUBCODE OUT)	PKP-038

## Function Board Assembly (PWM-215)

### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★ ★	IC201, IC202	BA6250
★ ★	Q201, Q202	2SA937F (2SA937LNF)
★ ★	Q203	DTA124EF
★	D206, D207	1SS254
★	D201	LB-402VB3
★	D202, D205, D208	SLH-56VC3H
★	D204	SLH-56DC3H
★	D203	SLH-56MC3H

### SWITCHES

Mark	Symbol & Description	Part No.
★ ★	S201 – S210 Tact switch	PSG-058

### CAPACITORS

Mark	Symbol & Description	Part No.
	C201	CKDYF103Z50

### RESISTORS

*NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

Mark	Symbol & Description	Part No.
	All resistors	RD1/6PM □□□J

## Remote Control Unit (PWW-003)

### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★ ★	IC1	μPD6102G
★ ★	Q1	2SC2021LN (2SC1740S)
★ ★	Q2	2SC2673 (2SC3377)
★	D1	SE303A-Y (SE303)
★	D3 – D6	1S2473

### CAPACITORS

Mark	Symbol & Description	Part No.
	C1	CEAS470M10
	C3, C4	CCDCH101J50

### RESISTORS

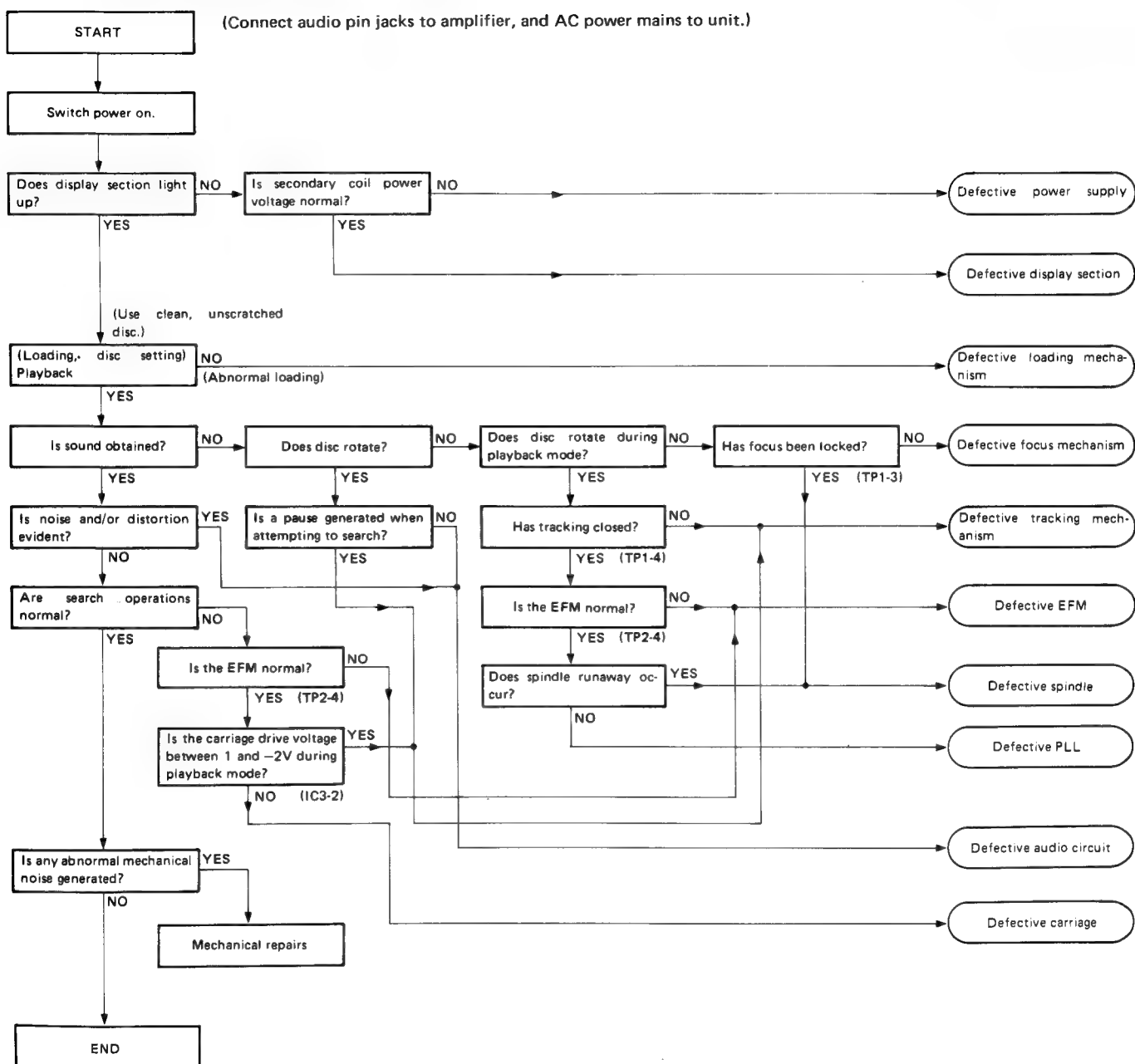
*NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.*

Mark	Symbol & Description	Part No.
	R1 – R4	RD1/4PM □□□J

### OTHERS

Mark	Symbol & Description	Part No.
★	X1 Ceramic resonator	CSB500EBL (KBR500BTL)

## 10. TROUBLESHOOTING



Defective power supply

Check for breaks in solder bridge pattern

Check power switch and power cord

120V/60Hz TYP values

	IN	OUT
IC21	+16 ~ 17V	+12V
IC22	-16 ~ -17V	-12V
IC23	+10 ~ 11V	+5V
IC24	-10 ~ -11V	-5V
Q23	Collector -30V to -33V	Emitter -26V

Power on /off switching noise

Is the Q21 collector at H level (about +10V) when the power is switched on or off?

NO

Check D9 thru D12, C131, C132, and R155 thru R158 for solder bridges and other soldering faults

YES

Check Q17 thru Q20 and R155 thru R158 for solder bridges and other soldering faults

TYP values

Is the Q11 collector at H level?

NO

Is the D9 anode about -6V?

NO

Check R167 thru R173, D11 and D12, and C131 for solder bridges and other soldering faults

YES

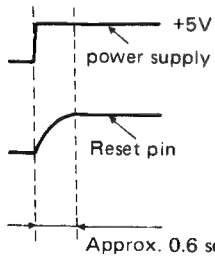
Is input applied to IC6, IC9, IC11, and IC12?

NO

Check around R120, Q11 and C73 for solder bridges and other soldering faults

YES

Is the reset time constant normal?



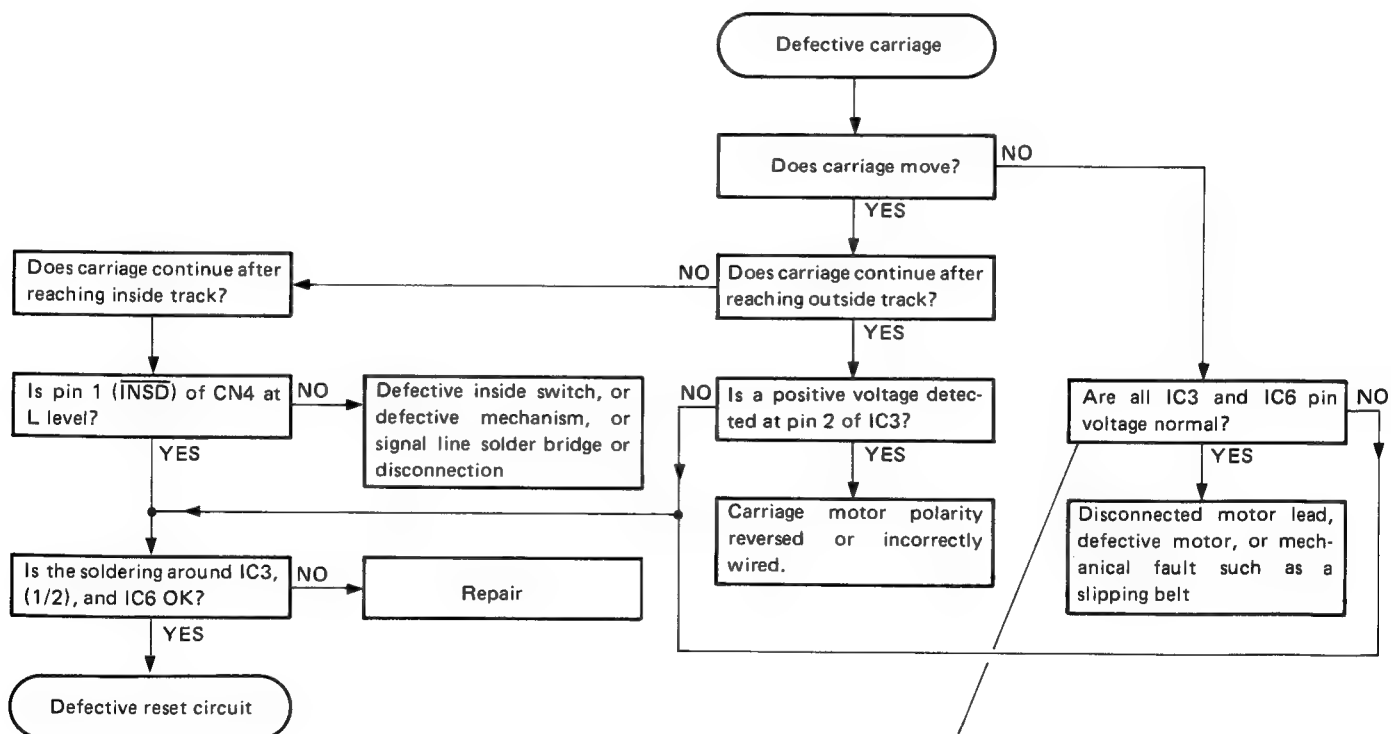
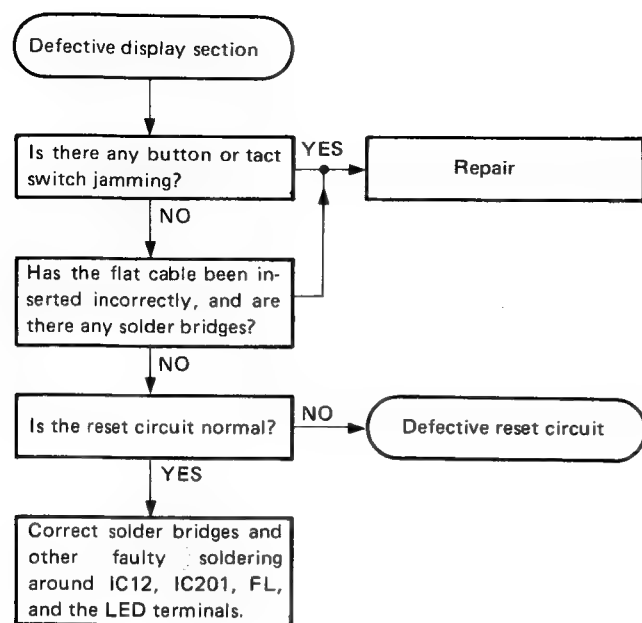
NO

Check for solder bridges, pattern cracks, and other soldering faults

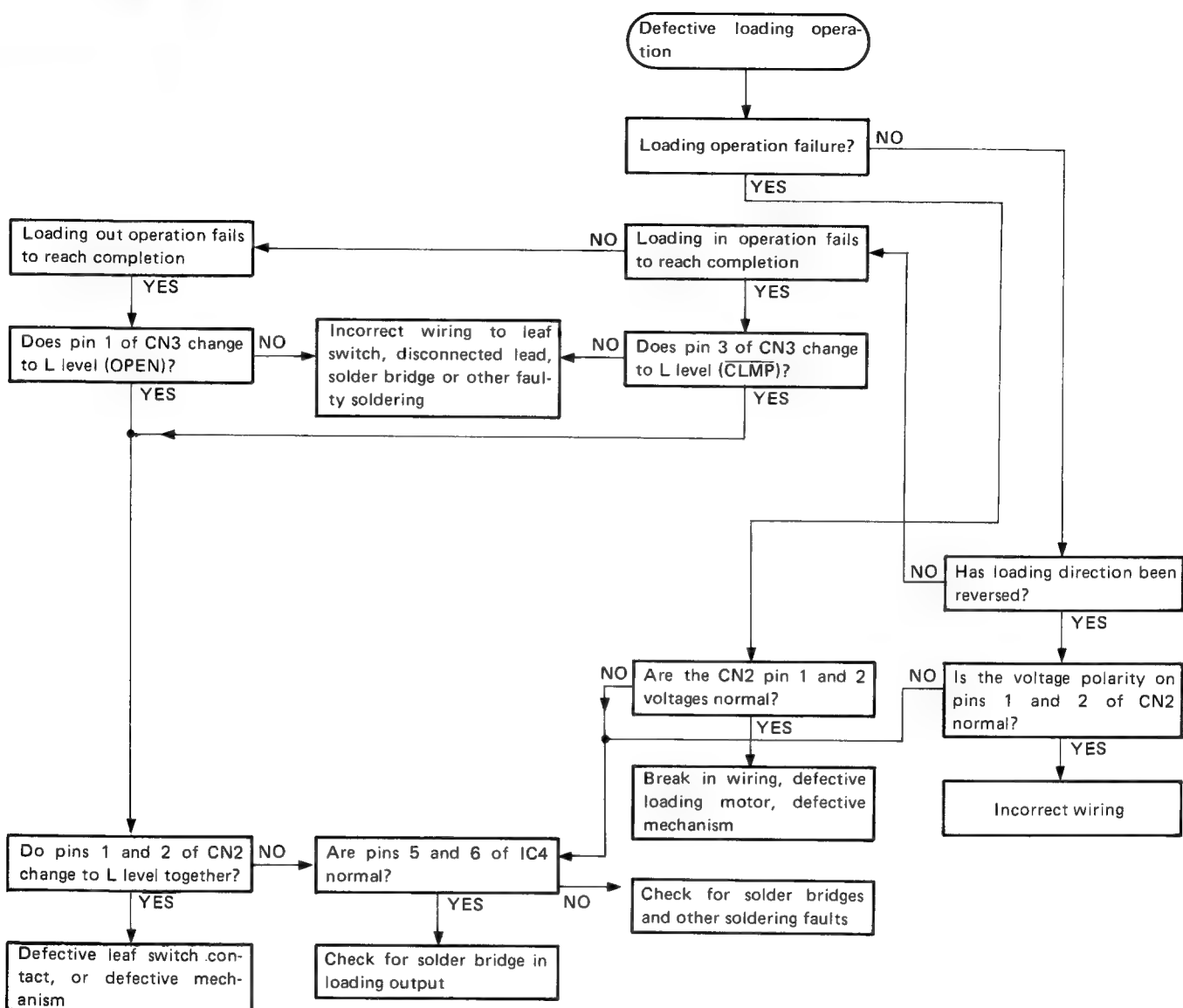
Check around R118, R121 and C74 for solder bridges and other soldering faults

YES

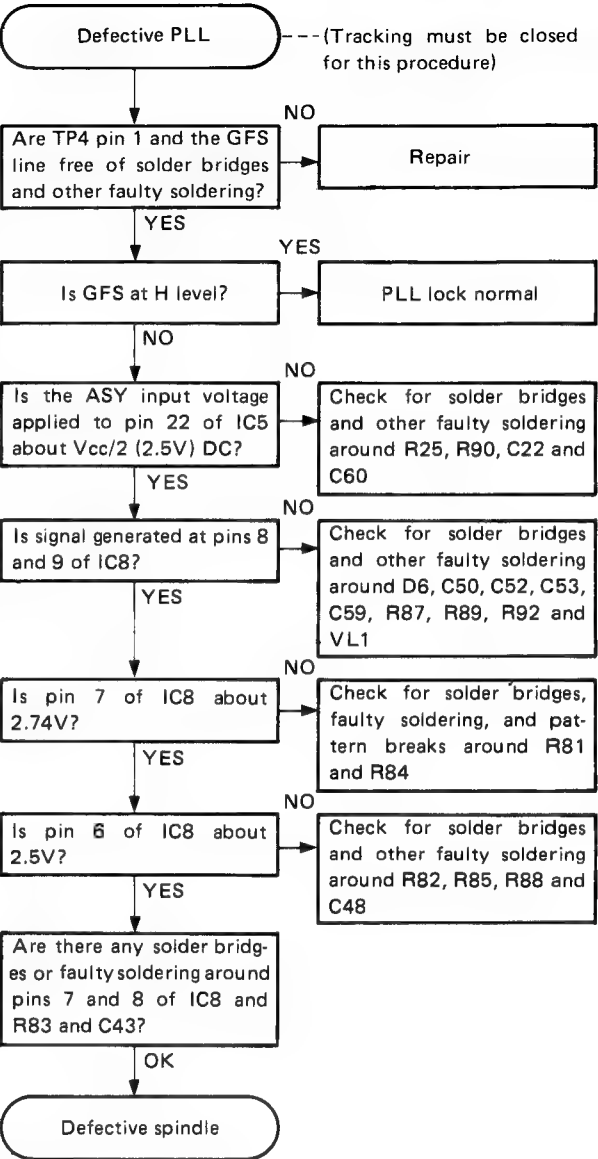
Normal

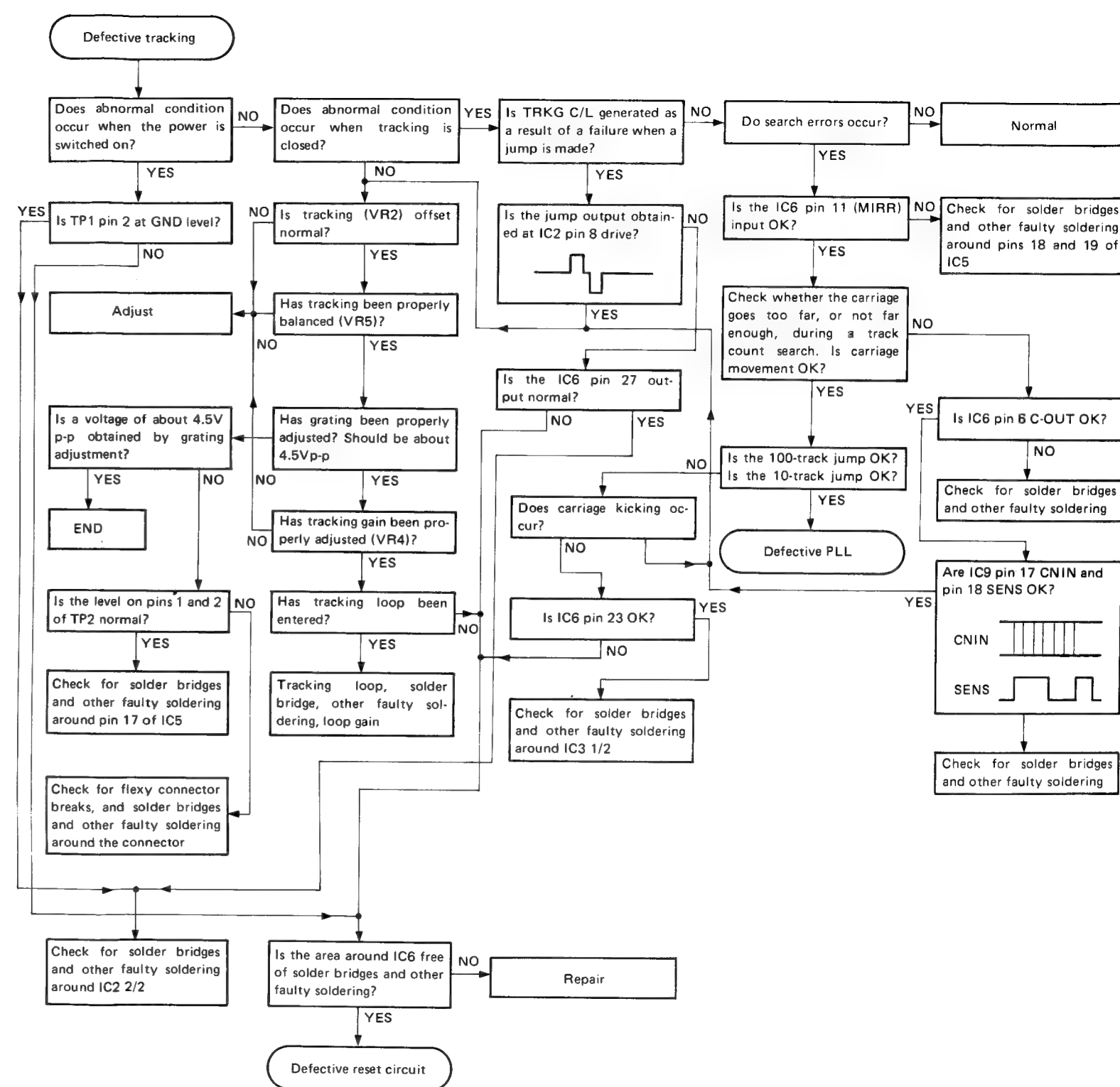
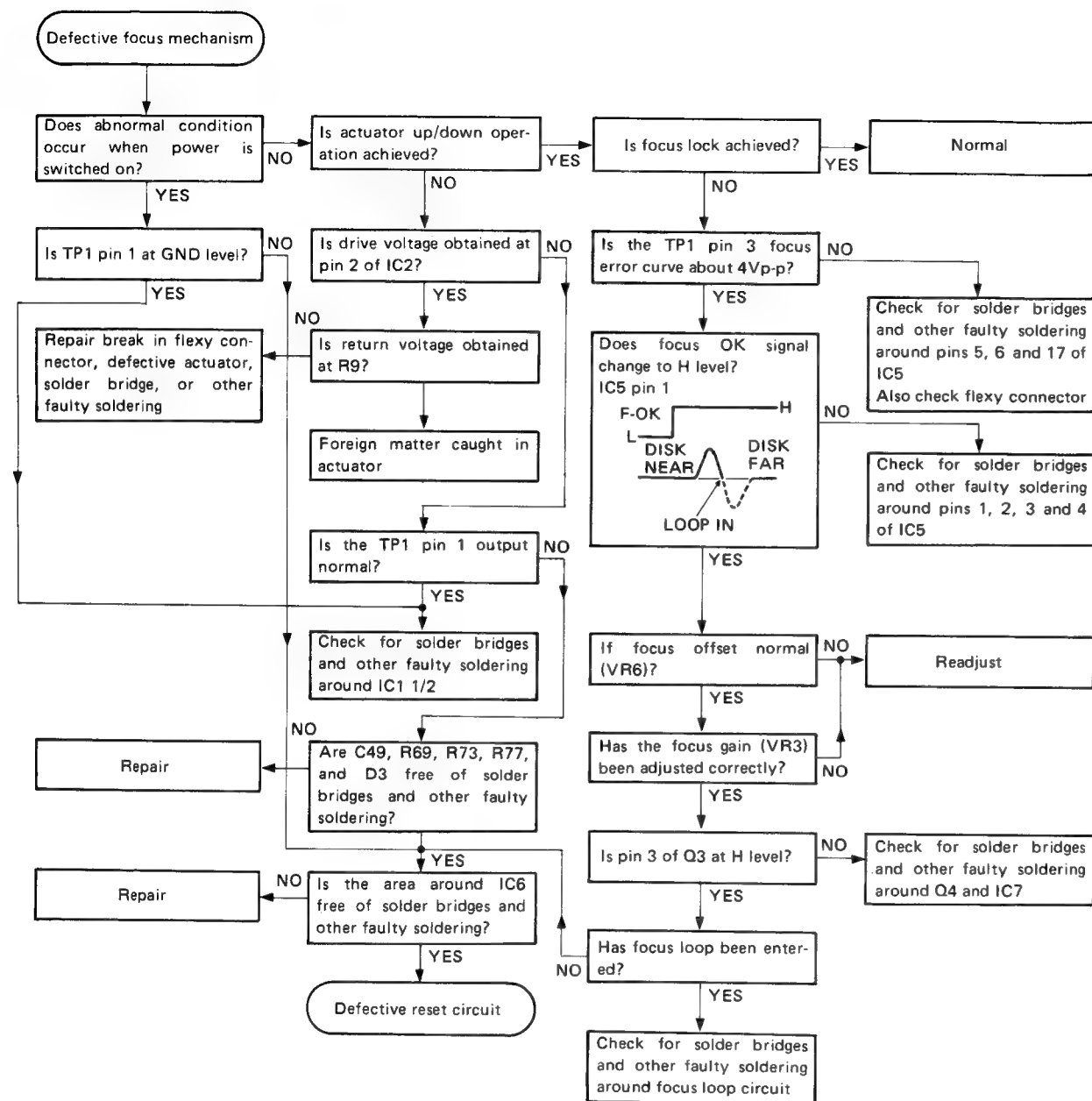


Point Mode	IC3 2 Pin	IC6 23 Pin
Playback	+1 ~ -2V	+0.09 ~ -0.18V
Forward (outer tracks)	-9 ~ -11V	-0.8 ~ -1V
Reverse (inner tracks)	+9 ~ +11V	+0.8 ~ 1V
Stop	0V	0V

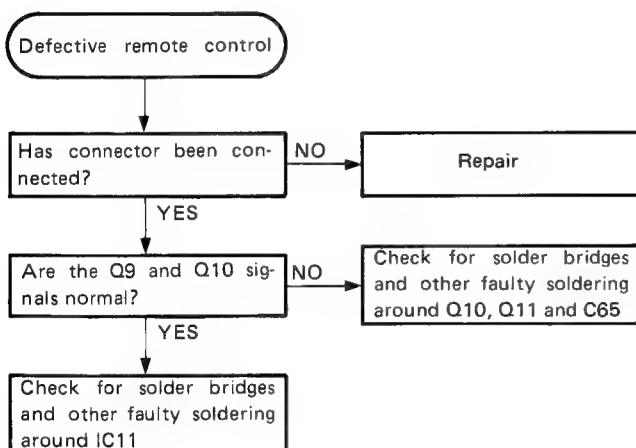
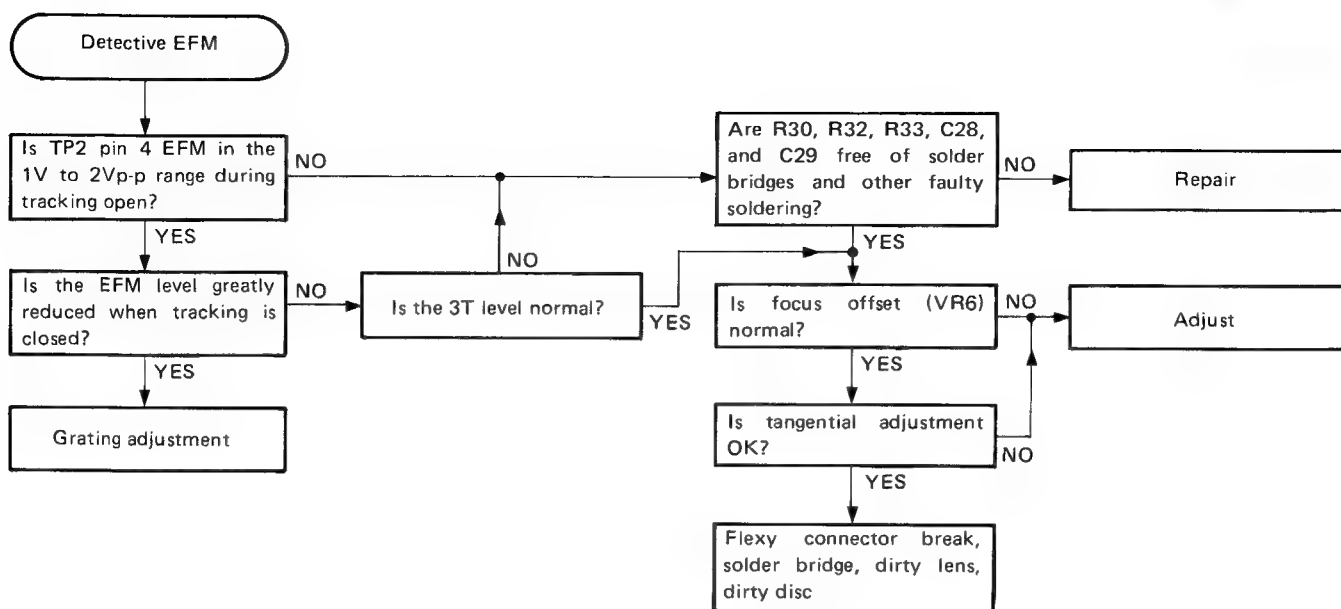


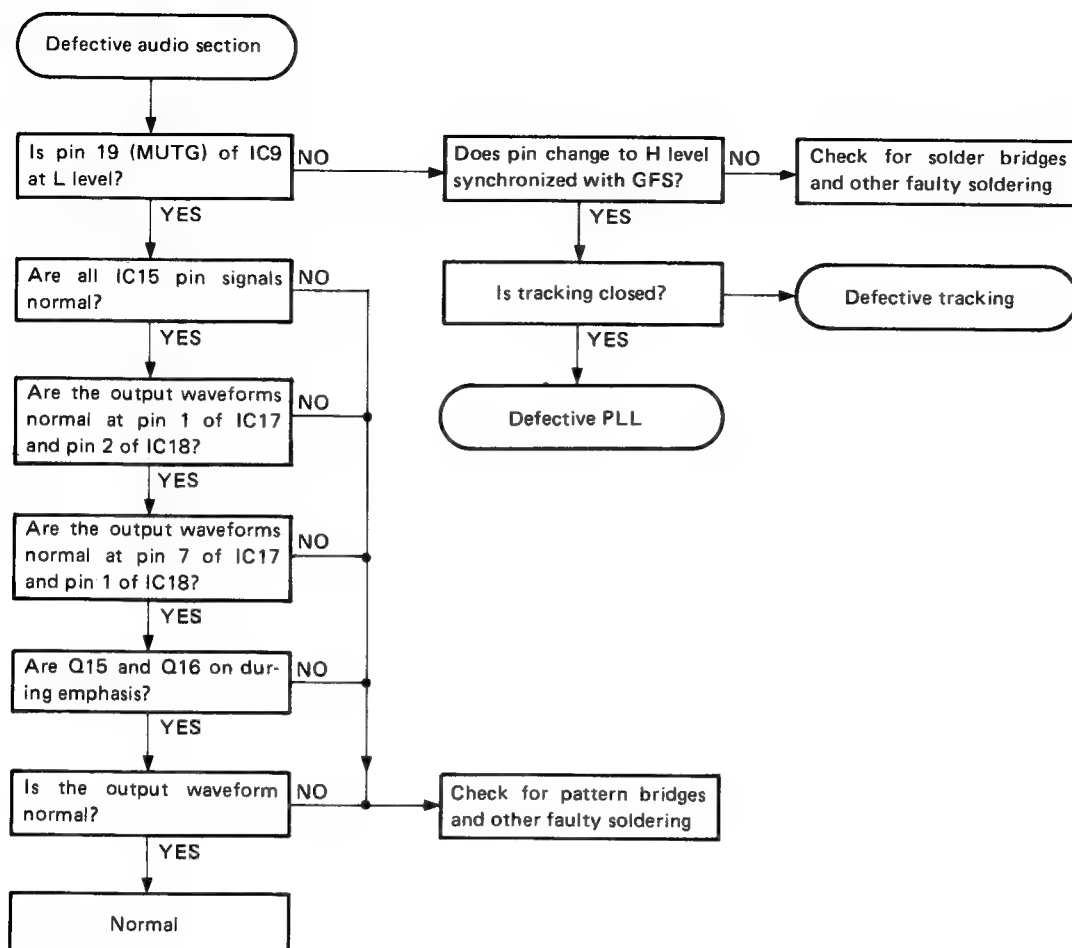
Point Mode	IC4 5 Pin	IC4 6 Pin	CN2 1 Pin	CN2 2 Pin
Loading in	L	H	0V	+8 ~ 10V
Loading out	H	L	+8 ~ 10V	0V
Loading in completed	H	H	0V	0V
Loading out completed	L	L	0V	0V











## 11. ADJUSTMENTS

The Compact Disc Player adjustment are to be executed in the following order.

### ● Adjustment Items

1. Tracking offset and focus offset adjustments
2. LD (laser diode) power check
3. Focus lock and spindle lock checks
4. Grating adjustment
5. Tracking balance adjustment
6. Tangential adjustment
7. Focus gain adjustment
8. Tracking gain adjustment
9. VCO free-run frequency adjustment

### ● Measuring Equipment

1. Dual trace oscilloscope
2. Optical power meter
3. Test disc (YEDS7)
4. Focus and tracking adjustment filters
5. Loop gain adjustment bandpass filter
6. Signal generator
7. Grating driver
8. Other regular measuring equipment

### ● Test Mode

Disc player adjustments are executed in test mode.

#### — Test mode setting and cancellation procedures —

- (1) Switch POWER (S401) on while depressing the TEST MODE switch (S1).
- (2) Then switch the MANUAL SEARCH FWD (  $\gg$  ) or REV (  $\ll$  ) switch on to activate test mode.
- (3) Test mode is cancelled by switching POWER off.

The various key functions during test mode are listed in Table 11-1.

### ● Adjustment Controls

- VR2: Tracking offset (TR.OF)  
 VR3: Focus gain (FO.GA)  
 VR4: Tracking gain (TR.GA)  
 VR5: Tracking balance (TR.BL)  
 VR6: Focus offset (FO.OF)  
 VL1: VCO free run (VCO coil)

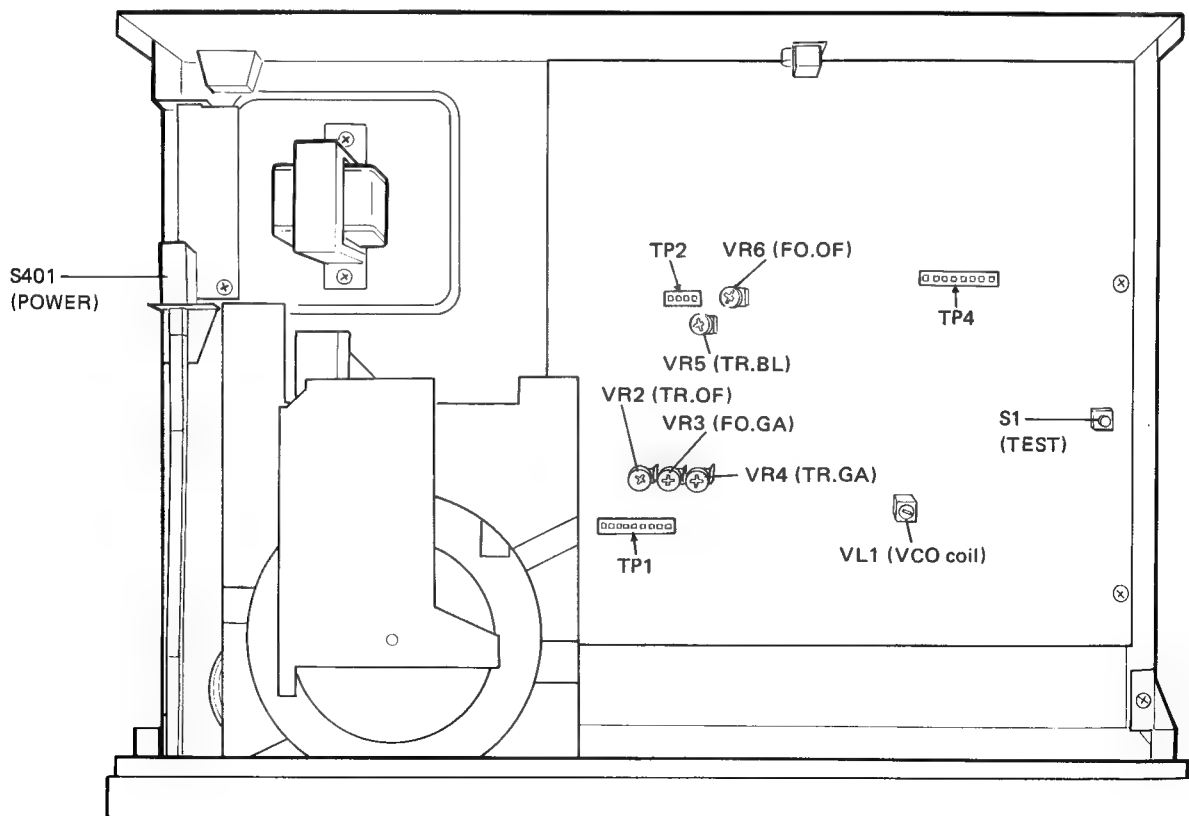

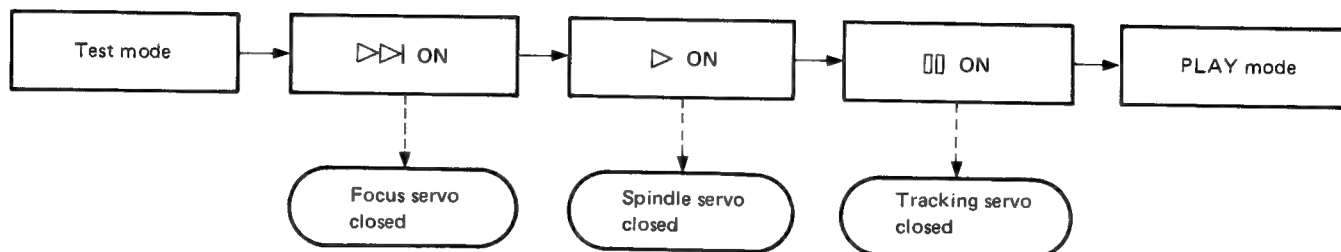


Fig. 11-1 Adjustment Points

During test mode, each servo mechanism can be closed and opened by separate operations. Consequently, each servo must be closed one at a time

(in serial sequence) to set play mode. Note that play mode is not activated by simply pressing the PAUSE key (  ) during test mode.

Example: Switch from stop to play mode.



- The servo mechanisms comply with a serial sequence during test mode.

#### • Key Function in Test Mode









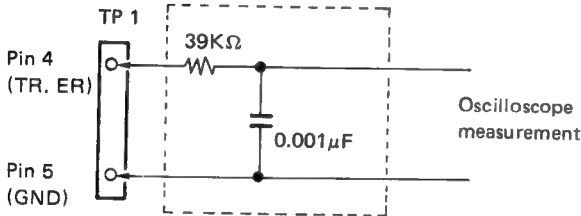
Symbol	Key	Function during test mode	Description
	TRACK FWD	Focus servo closed	Laser diode lights up, focus actuator is moved up/down, and focus servo is closed.
	PLAY	Spindle servo closed	Spindle servo closed in CLV-A mode after spindle motor is kicked.
	PAUSE	Tracking servo closed/opened	Tracking servo closed by pressing in a toggle action, and player is switched to play mode (with the focus and spindle servos closed). PAUSE indicator lights up, and tracking servo is opened when pressed a second time.
	MANUAL SEARCH REV	Carriage reverse (towards disc center)	Carriage is moved towards disc center at the fast speed of about 1cm/sec. Since there is no safety mechanism to stop the carriage, do not move it too far.
	MANUAL SEARCH FWD	Carriage forward (towards disc edge)	Carriage is moved towards disc edge at the fast speed of about 1cm/sec. Since there is no safety mechanism to stop the carriage, do not move it too far.
	REPEAT	Lens moved up/down	The laser diode lights up, and the focus actuator is moved up/down. The focus servo is not closed.
	STOP	Stop	All servos are stopped and reset to the initial status.
	OPEN/CLOSE	(Disc tray) opened/closed	Disc tray is opened/closed. Note pickup does not return to arm rest when tray is opened, and remains in the same position when tray is closed.

Table 11-1

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
1	TRACKING OFFSET AND FOCUS OFFSET ADJUSTMENTS					
			TP 1 Pin 9 (TR. RT)  TP 1 Pin 3 (FO. ER)	VR 2 (TR. OF)  VR 6 (FO.OF )	0V ± 10mV  0V ± 10mV	<ul style="list-style-type: none"><li>Set the player to test mode (see page 53)</li><li>Adjust the voltage at TP1 pin 9 TR.RT (tracking return) to 0V ±10mV by turning the VR2 TR.OF (tracking offset) control.</li><li>Adjust the voltage at TP1 pin 3 FO.ER (focus error) to 0V ±10mV by turning the VR6 FO.OF (focus offset) control.</li></ul>
2	LD (LASER DIODE) POWER CHECK					
				VR 1	Specified rating (0.26mW ± 0.02mW)	<ul style="list-style-type: none"><li>Set to normal mode. (Normal mode can be set by switching the power off and on again.)</li><li>Position the optical power meter sensor immediately above the object lens.</li><li>Press the PLAY key without a disc loaded, and check that the LD (laser diode) power reading in the optical power meter is within the specified rating range (0.26mW ±0.02 mW).</li></ul>
3	FOCUS LOCK AND SPINDLE LOCK CHECKS					
	V 0.5V/div	H 100msec /div	TP2 pin 4 (RF output)		RF output generated  Normal rotation	<ul style="list-style-type: none"><li>Load the test disc.</li><li>Set the player to test mode (see page 53)</li><li>Press the MANUAL SEARCH FWD key (▶▶) to move the pick-up to about the center of the disc. Note that step must be executed.</li><li>Observe TP2 pin 4 RF (RF output) by oscilloscope to check that an RF output signal is generated when the TRACK FWD key (▶▶I) is pressed.</li><li>Press the PLAY key ( ▶ ) and check that the disc rotates at normal speed (about 300rpm near the center of the disc) in the correct direction (clockwise).</li></ul>

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
4	GRATING ADJUSTMENT					
			TP 1 Pin 4 (TR. ER)	Grating	NULL point	<ul style="list-style-type: none"><li>• Load the test disc.</li><li>• Set the player to test mode (see page 53)</li><li>• Press the TRACK FWD ( <math>\triangleright\triangleright</math> ) and PLAY ( <math>\triangleright</math> ) keys in that order to close the focus and spindle servos (leaving the tracking servo open).</li><li>• Using the MANUAL SEARCH FWD key ( <math>\triangleright\triangleright</math> ), move the pick-up to a position near the center of the disc, and ensure that the grating driver (R-122) can enter the pick-up grating adjustment hole from the left hand side of the set by the pick-up movement. (See Figure 11-3)</li><li>• Observe the TP1 pin 4 TR.ER (tracking error) waveform by oscilloscope. Insert a 4kHz cut-off low pass filter at this stage. (See Figure 11-2)</li></ul>
<div><p style="text-align: center;">L.P.F.</p><p style="text-align: center;">Fig. 11-2</p></div>						
				Grating	Maximum amplitude	<ul style="list-style-type: none"><li>• Insert the tracking driver into the adjustment hole and turn the driver to find the NULL point (see Photograph 11-1).</li><li>• At this stage, gently press against the pick-up with a screwdriver etc as indicated in Figure 11-3 to prevent the pick-up from rising when the grating driver is tuned.</li><li>• Next turn the grating driver slowly clockwise from the NULL point and adjust to the position where the waveform (tracking error signal) first reaches maximum amplitude (see Figure 11-3).</li></ul>
			X axis TP2 pin 1 (BKTE)	Grating	Lissajous 45°	<p><i>Note:</i> Press the down on the grating driver to ensure that the pick-up does not float upwards.</p> <ul style="list-style-type: none"><li>• Connect TP2 pin 1 (BKTE) to the X axis of the oscilloscope, and pin 2 (FWTE) to the Y axis by AC coupling, and observe the Lissajous pattern (see Photograph 11-4).</li></ul>
			Y axis TP2 pin 2 (FWTE)			<ul style="list-style-type: none"><li>• Fine adjust the grating driver to a position where the Lissajous pattern is practically as straight line (Lissajous 45°). (See Photograph 11-5)</li></ul>

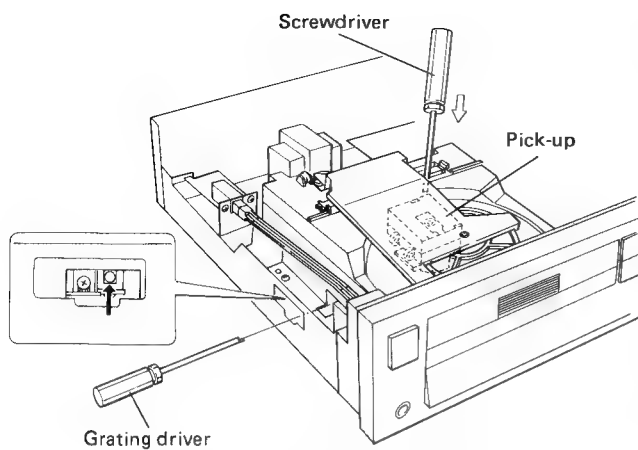
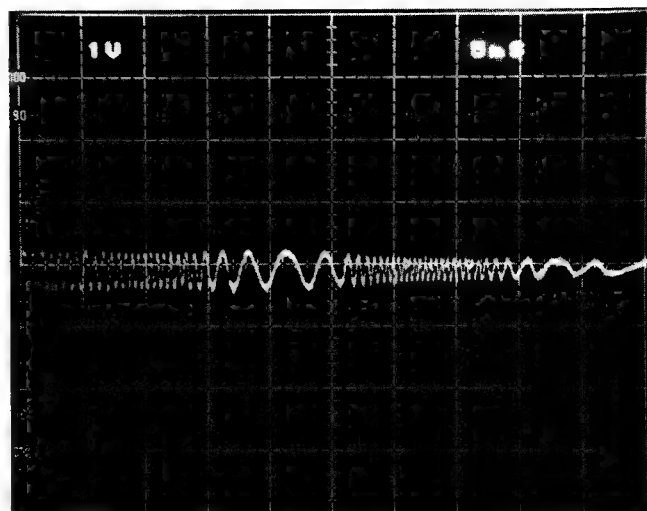
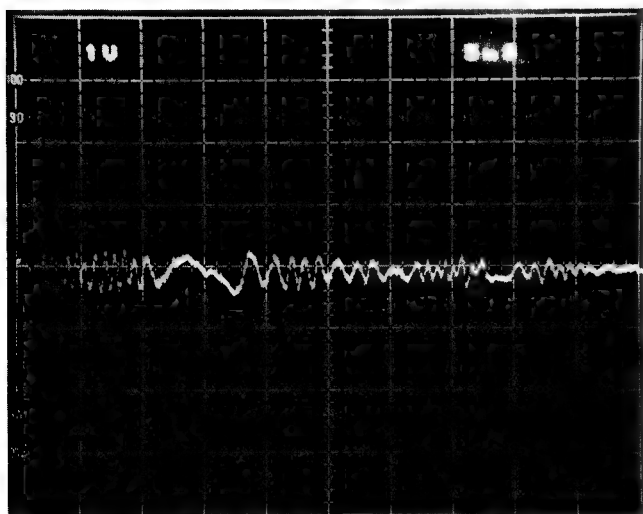


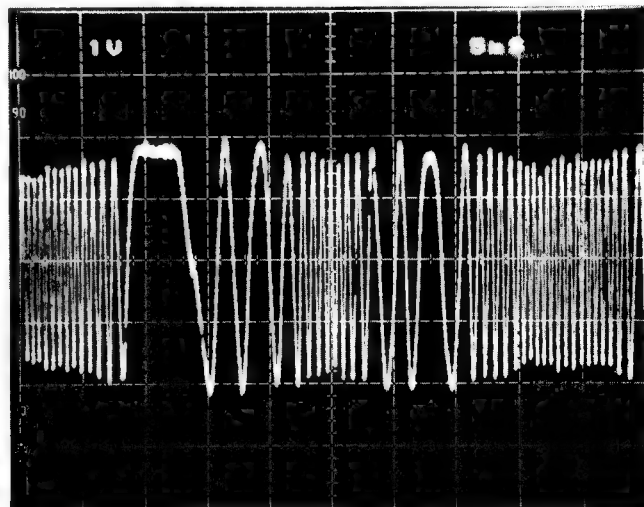
Fig. 11-3 Grating Adjustment



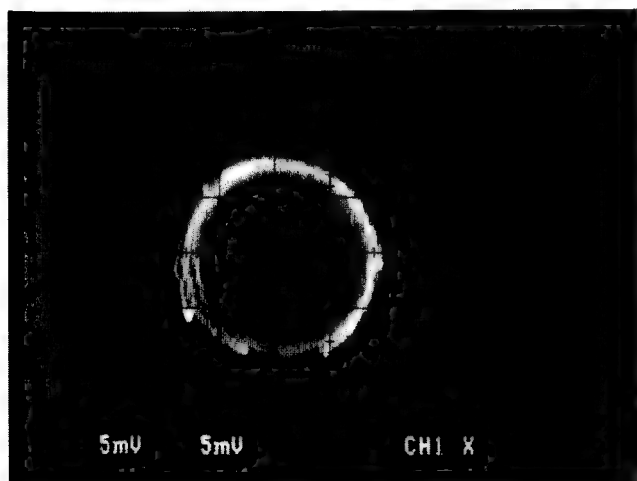
Photograph 11-1 NULL point



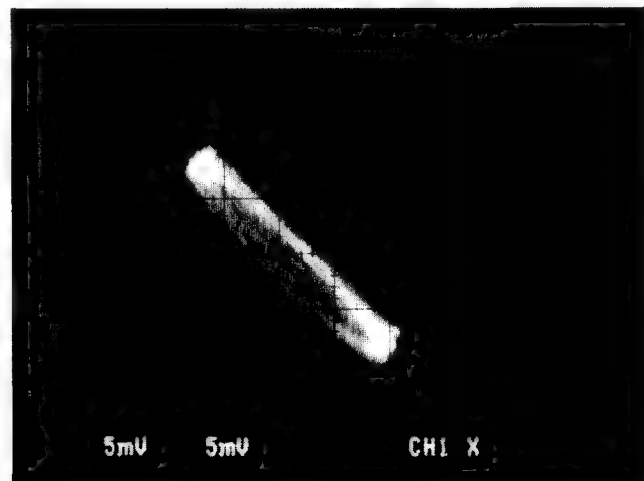
Photograph 11-2 Waveform beyond the NULL point



Photograph 11-3 Maximum amplitude

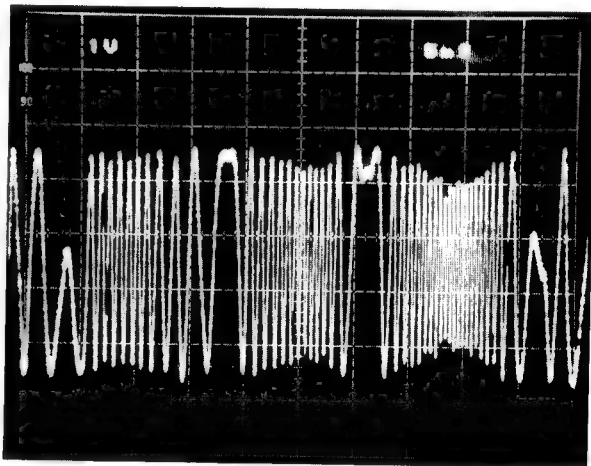


Photograph 11-4

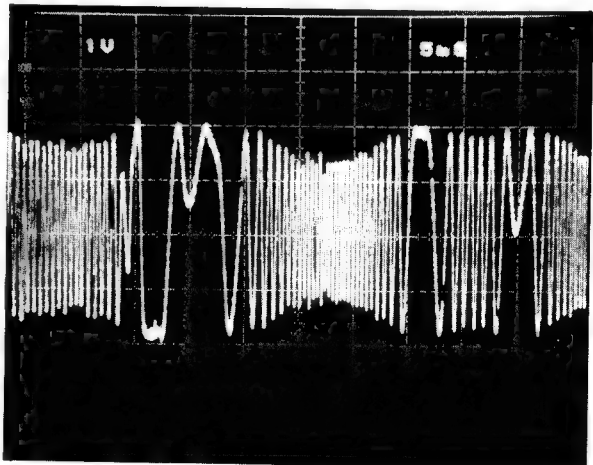


Photograph 11-5

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
5	TRACKING BALANCE ADJUSTMENT					
	1V/div	5msec /div	TP 1 Pin 4 (TR. ER)	VR 5 (TR. BL)		<ul style="list-style-type: none"><li>• Load the test disc.</li><li>• Set the player to test mode (see page 53)</li><li>• Move the carriage to a position near the center of the disc by using the MANUAL SEARCH FWD key (▷▷).</li><li>• Press the TRACK FWD key (▷▷) and then the PLAY key (▷) to start the disc turning.</li><li>• Observe TP1 pin 4 TR.ER (tracking error) in the oscilloscope, and eliminate the DC component of the tracking error by adjustment the VR5 TR.BL (tracking balance) control.</li></ul>



Photograph 11-6 DC components included



Photograph 11-7 DC components excluded



Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/Adjustment specifications	Adjustment procedure
	V	H				
6	TANGENTIAL ADJUSTMENT					
			TP2 pin 4 (RF output)	Tangential adjustment screw	Best eye pattern	<ul style="list-style-type: none"><li>• Load the test disc.</li><li>• Set the player to test mode (see page 53)</li><li>• Using the MANUAL SEARCH FWD key (▷), move the pick-up to the disc edge to enable the tangential adjustment screw to be seen from the left hand side (see Figure 11-5).</li><li>• Press the TRACK FWD (▷&gt;), PLAY (▷), and PAUSE (⏏) keys in that order to close all servos, (The PAUSE indicator will light up.)</li><li>• Observe the TP2 pin 4 RF (RF output) in the oscilloscope and adjust the tangential adjustment screw to obtain the clearest eye pattern. (Figure 11-5).</li><li>• The optimum position is the midpoint between the two positions where the eye pattern starts to deteriorate when the tangential adjustment screw is turned clockwise and counter clockwise. Guidelines for this adjustment: In addition to a clear overall waveform, adjust to obtain relatively slender lines (see photograph 11-8) Where single "diamond" shapes are formed in the eye pattern.</li><li>• To make the waveform easier to observe, insert a 10 kohm resistance (or 5 kohm if the waveform is hard to see) in the tip of the probe as shown in Figure 11-4.</li></ul>

The diagram shows a test setup for measuring the RF output. A probe is connected to Pin 4 (RF) and Pin 3 (GND). A 10KΩ resistor is inserted in the tip of the probe. The probe is connected to an oscilloscope.

Fig. 11-4

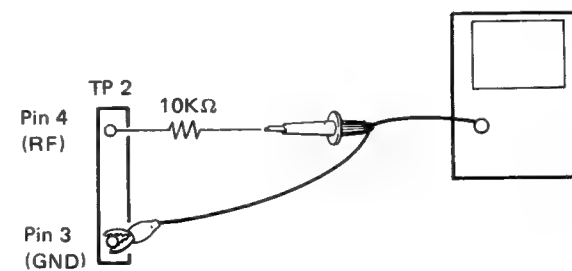


Fig. 11-4

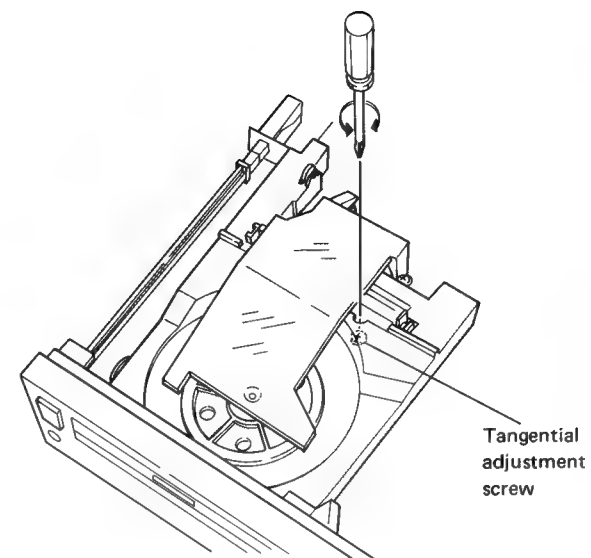
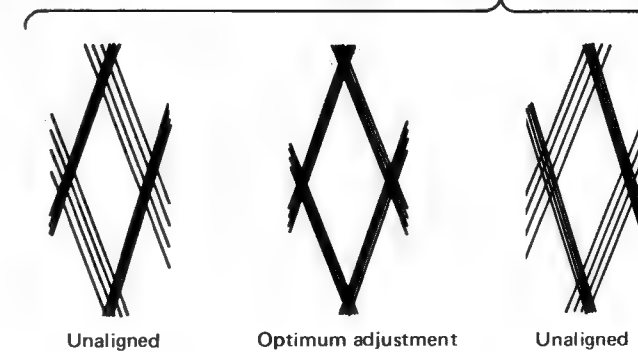
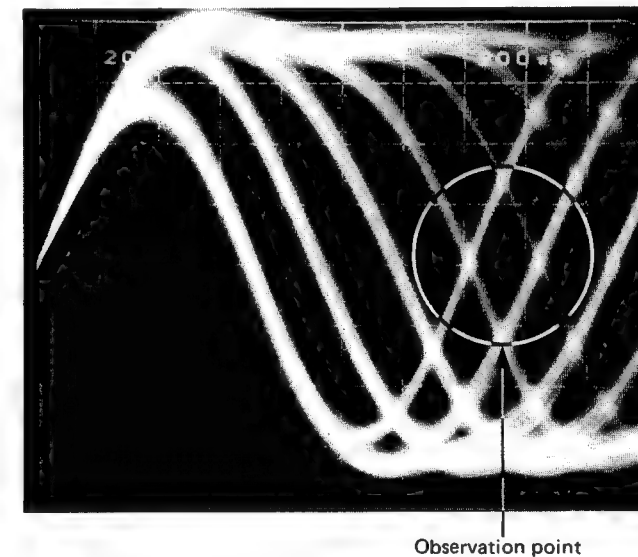
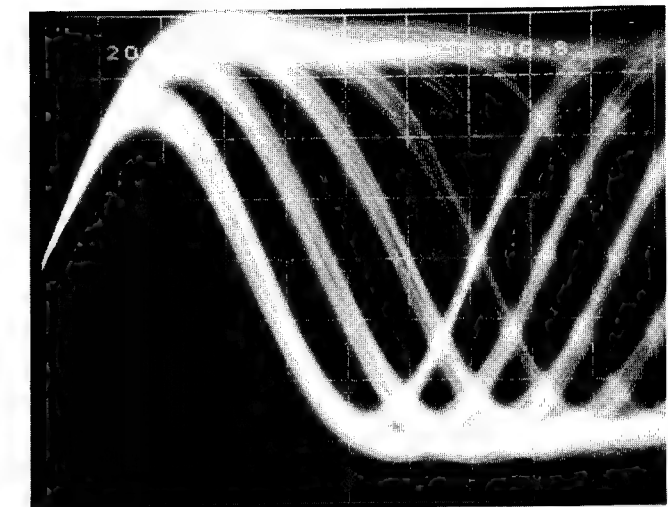


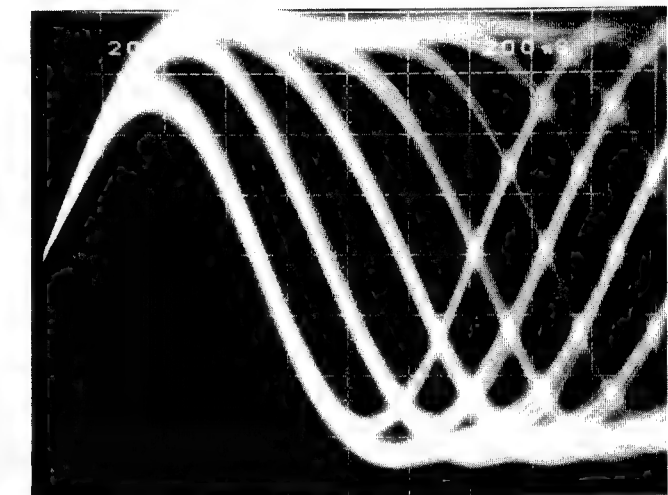
Fig. 11-5 Tangential Adjustment



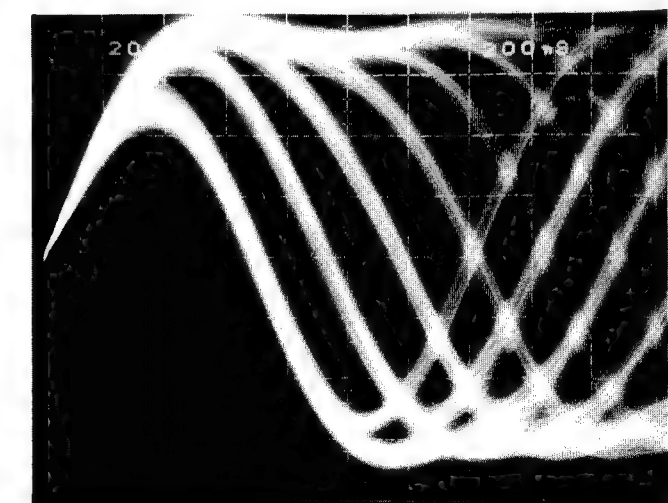
Photograph 11-8



Photograph 11-9



Photograph 11-10



Photograph 11-11

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
7	FOCUS GAIN ADJUSTMENT					
			TP 1 Pin 6 (FO. IN)  TP 1 Pin 1 (FO. OT)	VR 3 (FO. GA)	LED (green) on	<ul style="list-style-type: none"><li>Set the player to test mode (see page 53)</li><li>Press the STOP key (□) to switch all servos off.</li><li>Adjust the frequency and output voltage of CH1 of the F.T.G adjuster to 875Hz and 0.2Vp-p.</li></ul> <p><i>Note:</i> If adjusting the output voltage by oscilloscope, disconnect the cable from the F.T.G adjuster circuit board, and measure and adjust with the oscilloscope probe in direct contact with pin 3 of the N1 connector (plug). (Because of the hum generated, do not measure at the tip of the cable.)</p> <ul style="list-style-type: none"><li>Connect the F.T.G adjuster as shown in Figure 11-6.</li><li>Press the TRACK FWD (▷▷), PLAY (▷), and PAUSE (□□) keys in that order to switch all servos on.</li><li>Adjust the compact disc player VR3 FO.GA (focus gain) control so that F.T.G adjuster Just LED (green) comes on.</li></ul> <div><div>C.D PLAYER</div><div><div>Pin 6 (FO. IN)</div><div>Pin 1 (FO. OT)</div><div>Pin 5 (GND) TP 1</div></div><div><div>ORANGE WIRE</div><div>BROWN WIRE</div><div>BLACK WIRE</div></div><div><div>F.T.G. Adjustor</div><div>(R-878)</div></div></div> <p>Fig. 11-6</p> <div></div> <p>Photograph 11-12 F.T.G adjuster</p>

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/Adjustment specifications	Adjustment procedure
	V	H				
8	TRACKING GAIN ADJUSTMENT					
			TP 1 Pin 7 (TR. IN)  TP 1 Pin 2 (TR. OT)	VR 4 (TR. GA)	LED (green) on	<ul style="list-style-type: none"><li>Set the player to test mode (see page 53)</li><li>Press the STOP Key (□) to switch all servos off.</li><li>Adjust the frequency and output voltage of CH2 of the F.T.G adjuster to 1125Hz and 0.4Vp-p.</li></ul> <p><i>Note:</i> If adjusting the output volage by oscilloscope, disconnect the cable from the F.T.G adjuster circuit board, and measure and adjust with the oscilloscope probe in direct contact with pin 4 of the N1 connector (plug). (Because of the hum generated, do no measure at the tip of the cable.)</p> <ul style="list-style-type: none"><li>Connect the F.T.G adjuster as shown in Figure 11-7.</li><li>Press the TRACK FWD (▷▷), PLAY (▷), and PAUSE (□□) keys in that order to switch all servos on.</li><li>Adjust the compact disc player VR4 TR.GA (tracking gain) control so that the F.T.G adjuster Just LED (green) comes on.</li></ul> <div><div>C.D PLAYER</div><div><div>TP 1</div><div>Pin 7 (TR. IN)</div><div>Pin 2 (TR. OT)</div><div>Pin 5 (GND)</div></div><div><div>YELLOW WIRE</div><div>RED WIRE</div><div>BLACK WIRE</div></div><div><div>F.T.G. Adjustor</div><div>(R-878)</div></div></div>

Fig. 11-7

Step No.	Oscilloscope position		Test points	Adjustment positions	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
9	VCO FREE-RUN FREQUENCY ADJUSTMENT					
	0.5V/div		IC 8 (2/2) Pin 8		Write the Center Value of the Waveform	<ul style="list-style-type: none"><li>Set the player to test mode (see page 53)</li><li>Press the STOP Key (□) to switch all servos off.</li><li>Press the TRACK FWD (▶▶) and PLAY (▶) keys in that order to close the focus and spindle servos.</li><li>Observe the waveform at pin 8 of IC8 (2/2) by oscilloscope at this time. (V: 0.5V/div.) (Although C47, R83, R87, and other circuit elements are connected to pin 8, the waveform can be easily observed if observed at the legs of C47. See Figure 11-8.)</li><li>Write the center value of the waveform at pin 8 of IC8 (2/2).</li><li>Using the core driver, adjust the VL1 (VCO coil) core so that the center value of the oscilloscope waveform is the same as the previously recorded value when the PAUSE key (□) is pressed to switch the tracking servo on.</li></ul>
	0.5V/div		IC 8 (2/2) Pin 8	VL 1 (VCO coil)		

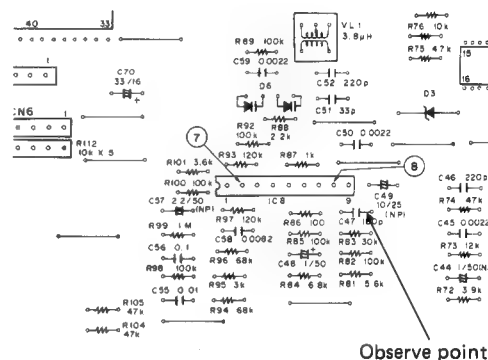


Fig. 11-8

## 11. RÉGLAGE

Les réglages du lecteur de disque compact s'effectuent de la manière suivante:

### ● Items de Réglage

1. Réglages de décalage d'alignement et de mise au point
2. Vérification de la puissance du LD (diode au laser)
3. Réglage de varrouillage de mise au point et de l'axe
4. Réglage de la mire
5. Réglage de l'équilibre d'alignement
6. Réglage tangentiel
7. Réglage du gain de mise au point
8. Réglage du gain d'alignement
9. Réglage de la fréquence de fonctionnement libre VCO

### ● Equipement de mesure

1. Oscilloscope de trace double
2. Indicateur de puissance optique
3. Disque d'essai (YEDS7)
4. Filtres de réglage de mise au point et d'alignement
5. Filtre passe-bande de réglage du gain de boucle
6. Générateur de signal
7. Tournevis de mire
8. Autres équipements de mesure d'usage courant

### ● Mode d'essai

Les réglages du lecteur de disque s'effectuent en mode d'essai.

#### Procédures de réglage et d'annulation du mode d'essai

- (1) Mettre en route le commutateur POWER (ALIMENTATION) (S401) tout en pressant le commutateur TEST MOE (MODE D'ESSAI) (SI).
- (2) Puis, mettre en route le commutateur MANUAL SEARCH FWD (RECHERCHE MANUELLE EN AVANT) ( << ) ou le commutateur REV (MARCHE ARRIERE) ( >> ) pour mettre en fonction le mode d'essai.
- (3) Le mode d'essai est annulé en mettant hors de service le commutateur POWER.

Les diverses fonctions des touches au cours du mode d'essai sont indiquées dans le tableau 11-1.

### ● Commandes de Réglage

- VR2: Décalage d'alignement (TR, OF)  
 VR3: Gain de mise au point (FO, GA)  
 VR4: Gain d'alignement (TR, GA)  
 VR5: Equilibre d'alignement (TR, BL)  
 VR6: Décalage de mise au point (FO/OF)  
 VL1: Fonctionnement libre VCO (bobine VCO)

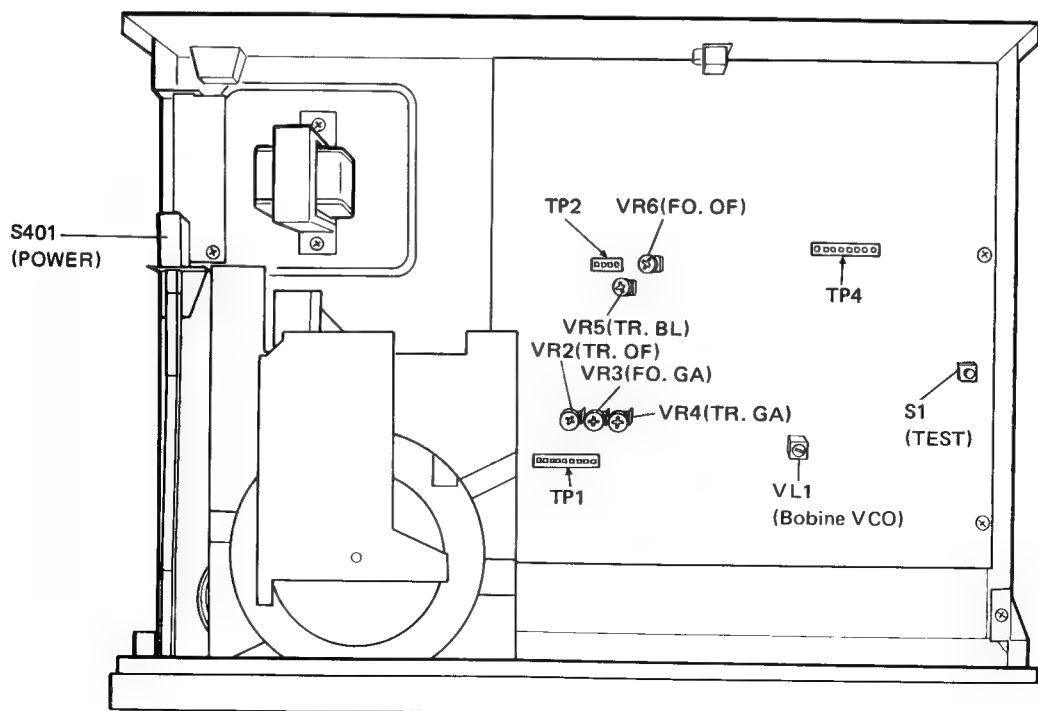

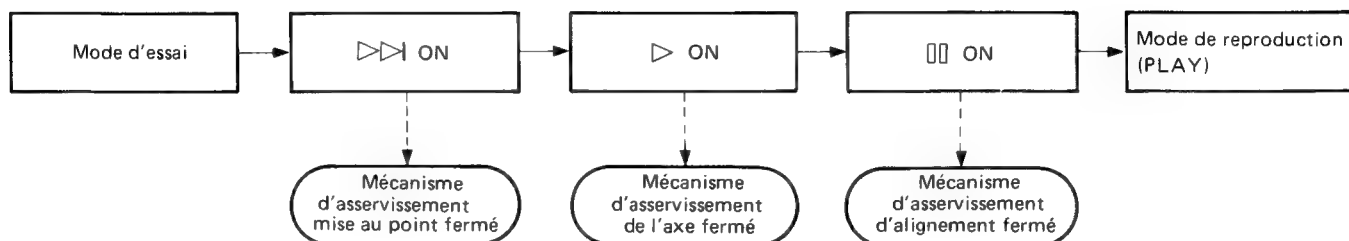


Fig. 11-1 Points de réglage

Au cours du mode d'essai, chaque mécanisme d'asservissement peut être fermé ou ouvert à travers des opérations différentes. Par conséquent, chaque mécanisme d'asservissement doit être fermé un à la fois (en séquence de série) pour régler le

mode de reproduction. Il faudrait remarquer que le mode de reproduction n'est pas mis en fonction en pressant tout simplement la touche de PAUSE (  ) au cours du mode d'essai.

Exemple: Commuter du mode d'arrêt au mode de reproduction.



- Les mécanismes d'asservissement fonctionnent conformément à la séquence de série au cours du mode d'essai.

#### • Fonctions des touches en mode d'essai









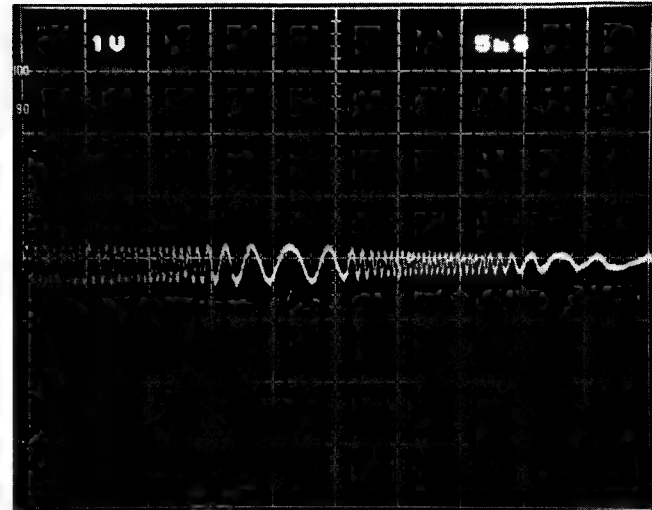
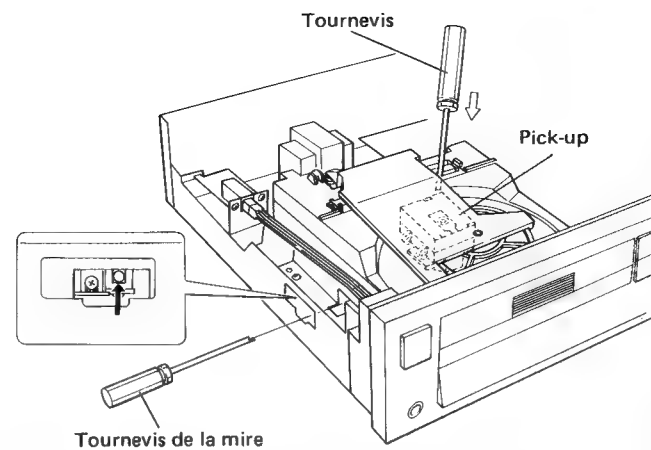
Symbole	Touche	Fonction durant le mode d'essai	Description
	TRACK FWD (Alignement en avant)	Mécanisme asservissement fermé	La diode laser s'allume, l'actionneur de mise au point se déplace vers le haut/le bas, et le mécanisme d'asservissement de mise au point se ferme.
	PLAY (Reproduction)	Mécanisme d'asservissement fermé	Mécanisme d'asservissement fermé en mode CLV-A après avoir démarré de moteur de l'axe.
	PAUSE	Mécanisme d'asservissement d'alignement fermé/ouvert	Le mécanisme d'asservissement se ferme en pressant le tumbler et le lecteur est commuté en mode de reproduction (avec les mécanismes d'asservissement de mise au point et de l'axe fermés). Le voyant PAUSE s'allume et le mécanisme d'asservissement est ouvert en pressant une deuxième fois.
	MANUAL SEARCH REV (Recherche manuelle en marche arrière)	Marche arrière du chariot (vers le centre du disque)	Le chariot est déplacé vers le centre du disque à une vitesse élevée d'environ 1 cm/seconde. Comme il n'y a aucun mécanisme de sécurité pour arrêter le chariot, ne pas le déplacer trop loin.
	MANUAL SEARCH FWD (Recherche manuelle en avant)	Marche avant du chariot (vers le bord du disque)	Le chariot se déplace vers le bord du disque à une vitesse élevée d'environ 1 cm/seconde. Comme il n'y a aucun mécanisme de sécurité pour arrêter le chariot, ne pas le déplacer trop loin.
	REPEAT (Répétition)	L'objectif se déplace vers le haut/le bas.	La diode laser s'allume, et l'actionneur de mise au point est déplacé vers le haut/vers le bas. Le mécanisme d'asservissement de mise au point n'est pas fermé.
	STOP (Arrêt)	Arrêt	Tous les mécanisme d'asservissement sont arrêtés et réenclenchés à l'état d'origine.
	OUVERT/FERME	(Plateau de disque)	Le plateau de disque est ouvert/fermé. Il faudrait remarquer que le pick-up ne retourne pas sur le support du bras de pick-up quand le plateau est ouvert, et reste sur la même position lorsque le plateau est fermé.

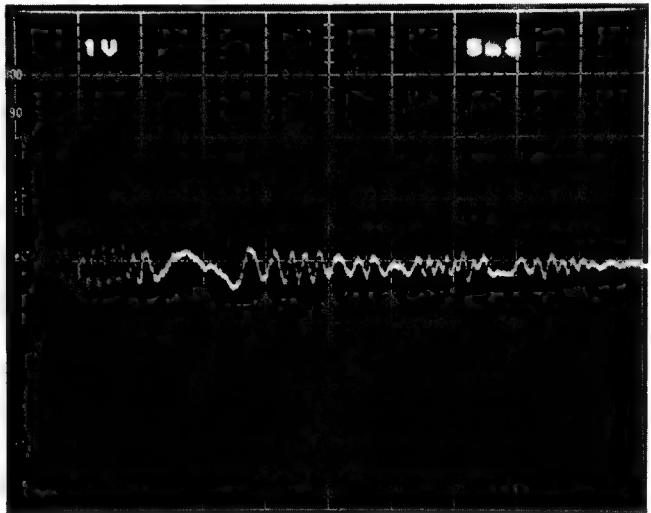
Tableau 11-1

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
1	REGLAGES DE DECALAGE D'ALIGNEMENT ET DE MISE AU POINT					
			TP1 Broche 3 (FO.ER)	VR 2 (TR. OF)	0V ± 10mV	<ul style="list-style-type: none"><li>• Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>• Régler la tension sur TP1 Broche 9 TR.RT (retour d'alignement) à une valeur de 0 V ± 10 mV en tournant la commande de VR2 TR.OF (décalage d'alignement).</li><li>• Régler la tension sur TP1 Broche 3 FO.ER (erreur de mise au point) sur une valeur de 0 V ± 10 mV en tournant la commande de VR6 FO.OF (décalage de mise au point).</li></ul>
			TP1 Broche 9 (TR.RT)	VR 6 (FO.OF )	0V ± 10mV	
2	VERIFICATION DE LA PUISSANCE DU LD (DIODE AU LASER)					
				VR 1	Valeur nominale spécifiée	<ul style="list-style-type: none"><li>• Régler en mode d'essai. (Le mode normal peut être réglé en mettant l'interrupteur d'alimentation en et hors service).</li><li>• Placer le senseur de compteur de puissance optique juste au-dessus de l'objectif.</li><li>• Presser la touche de reproduction PLAY sans charger de disque et vérifier si la valeur indiquée de puissance de la LD (diode au laser) du compteur de puissance optique se trouve dans les limites spécifiées (0,26 mW ± 0.02 mW).</li></ul>
3	VERIFICATIONS DEVERROUILLAGE DE MISE AU POINT ET DE L'AXE					
	V 0,5 V/div.	H 100ms/ div.	TP2 Broche 4 (sortie RF)		Sortie RF générée  Rotation normale	<ul style="list-style-type: none"><li>• Charger le disque d'essai.</li><li>• Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>• Presser la touche MANUAL SEARCH FWD pour déplacer le pick-up à proximité du centre du disque. Il faudrait noter que cette étape devrait être exécutée.</li><li>• Observer TP2 Broche 4 RF (sortie RF) au moyen de l'oscilloscope pour vérifier si un signal de sortie RF est généré lorsque la touche TRACK FWD (▶▶) est pressée.</li><li>• Presser la touche PLAY (▶) et vérifier si le disque tourne à une vitesse normale (environ 300 tours/minute à proximité du centre du disque) dans la direction correcte (dans le sens des aiguilles d'une montre).</li></ul>

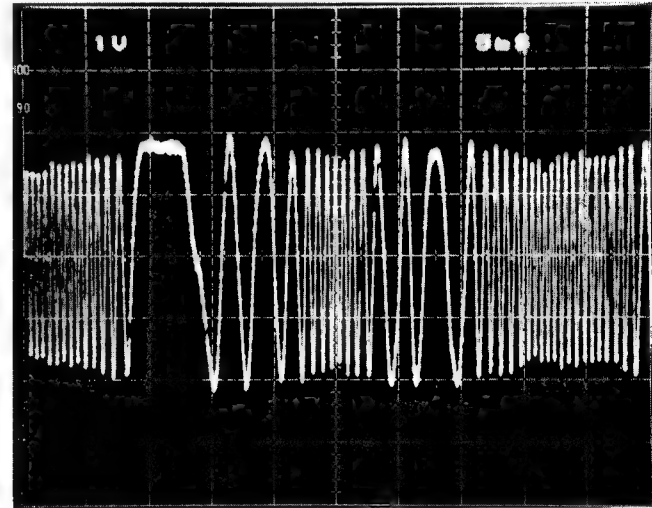
No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
4	REGLAGE DE LA MIRE					
			TP1 Broche 4 (TR.ER)	Mire	Point NULL	<ul style="list-style-type: none"><li>Charger le disque d'essai.</li><li>Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>Presser les touches TRACK FWD (▷◁) et PLAY (▷) selon cet ordre pour fermer les mécanisme d'asservissement de mise au point et de l'axe (en laissant ouvert le mécanisme d'asservissement d'alignement).</li><li>En utilisant la touche MANUAL SEARCH FWD (▷▷), déplacer le pick-up à proximité du centre du disque, et veiller à ce que le tournevis de la mire (R-122) puisse passer à travers le trou de réglage de la mire du pick-up à partir du côté gauche de l'appareil en déplaçant le pick-up. (Se référer à la figure 11-3).</li><li>Observer la forme d'ondes de TP1 Broche 4 TR.ER (erreur d'alignement) au moyen de l'oscilloscope, introduire un filtre passe-bas de coupure de 4 kHz, arrivé à cette étape. (Se référer à la figure 11-2).</li></ul>
<div><p>L.P.F.</p><p>Mesure de l'oscilloscope</p></div> <p>Fig. 11-2</p>						
				Mire	Amplitude maximum	<ul style="list-style-type: none"><li>Introduire le tournevis d'alignement dans le trou de réglage et tourner le tournevis pour obtenir le point NULL (se référer à la photographie 11-1).</li><li>A cette étape, presser légèrement le pick-up avec un tournevis, comme indiqué dans la figure 11-3 pour empêcher le pick-up de s'élever lorsque l'on tourne le tournevis de la mire.</li><li>Puis tourner légèrement le tournevis de la mire dans le sens des aiguilles d'une montre à partir du point NULL et régler à la position pour laquelle la forme d'ondes (signal d'erreur d'alignement) atteigne en premier l'amplitude maximum (se référer à la figure 11-3).</li></ul>
			Axe X TP2 Broche 1 (BKTE)	Mire	Lissajous 45°	<p><i>Note:</i> Presser vers le bas le tournevis de la mire pour que le pick-up ne soit pas suspendu en l'air.</p> <ul style="list-style-type: none"><li>Connecter TP2 Broche 1 (BKTE) à l'axe X de l'oscilloscope, et la broche 2 (FWTE) à l'axe Y par le raccordement CA, puis observer le modèle Lissajous (se référer à la photographie 11-4).</li></ul>
			Axe Y TP2 Broche 2 (FWTE)			<ul style="list-style-type: none"><li>Effectuer le réglage fin du tournevis de la mire sur une position à laquelle le modèle Lissajous est pratiquement comme une ligne droite (Lissajous 45°). (Se référer à la photographie 11-5).</li></ul>



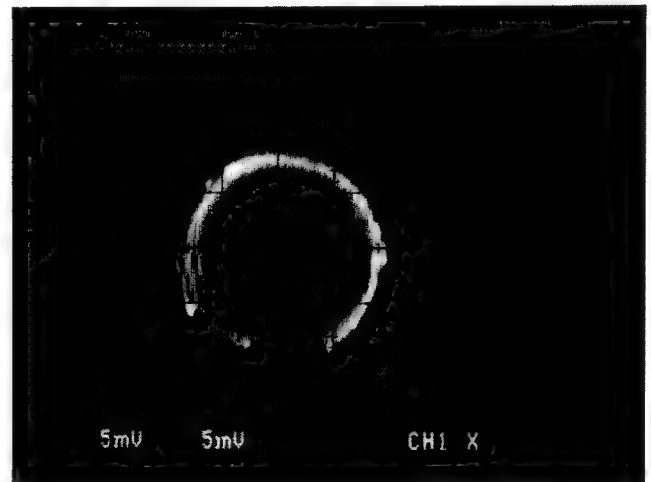
Photographie 11-1 Point NULL



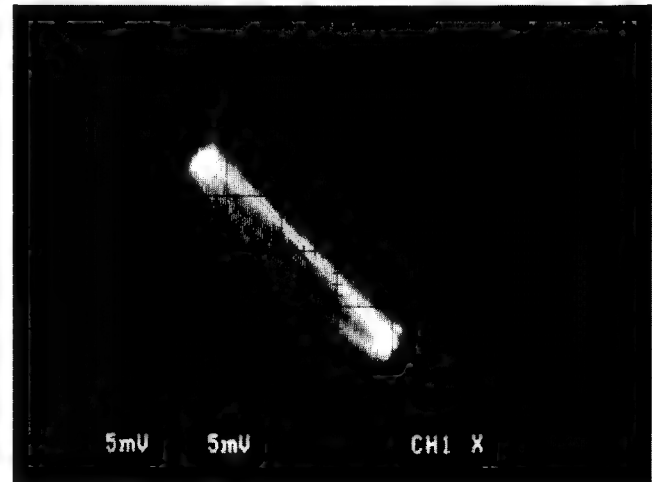
Photographie 11-2 Forme d'ondes au-delà du point NULL



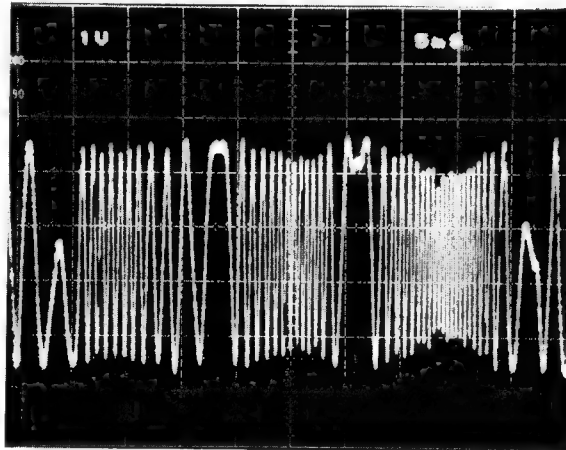
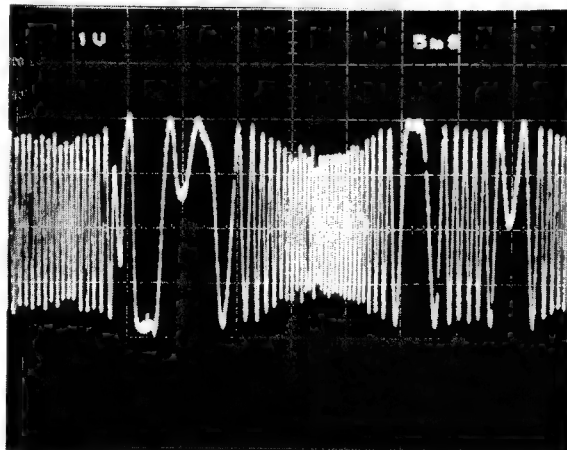
Photographie 11-3 Amplitude maximum

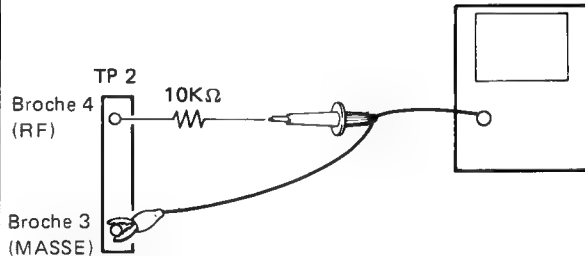


Photographie 11-4



Photographie 11-5

No. d'étape	Position de l'oscilloscope		Points d'essai	Posotions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
5	REGLAGE DE L'EQUILIBRE D'ALIGNEMENT					
	1 V/div.	5 ms/div.	TP1 Broche 4 (TR.ER)	VR 5 (TR. BL)		<ul style="list-style-type: none"><li>Charger le disque d'essai.</li><li>Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>Déplacer le chariot à une position à proximité du centre du disque en utilisant la touche MANUAL SEARCH FWD (▷▷).</li><li>Presser la touche TRACK FWD (▷▷), puis la touche PLAY (▷) pour faire tourner le disque.</li><li>Observer TP1 Broche 4 TR.ER (erreur d'alignement) dans l'oscilloscope, et éliminer la composante CC de l'erreur d'alignement en réglant la commande VR5 TR.BL (équilibre d'alignement).</li></ul> <div></div> <p>Photographie 11-6 Composantes CC comprises</p> <div></div> <p>Photographie 11-7 Composantes CC exclues</p>

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/Spécifications de réglage	Procédure de réglage
	V	H				
6	REGLAGE TANGENTIEL					
			TP2 Broche 4 (sortie RF)	Vis de réglage tangentiel	Meilleur modèle de vue	<ul style="list-style-type: none"><li>Charger le disque d'essai.</li><li>Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>Déplacer le pick-up au bord du disque, en utilisant la touche MANUAL SEARCH FWD (▷), pour pouvoir observer la vis de réglage tangentiel à partir du côté gauche (se référer à la figure 11-5).</li><li>Presser les touches TRACK FWD (▷▷), PLAY (▷) et PAUSE (⏏) selon cet ordre, pour fermer tous les mécanismes d'asservissement. (Dans ce cas le voyant PAUSE s'allumera).</li><li>Observer TP2 Broche 4 RF (sortie RF) dans l'oscilloscope et régler la vis de réglage tangentielle pour obtenir le modèle de vue le plus net. (Se référer à la figure 11-5).</li><li>La position optimale est un point intermédiaire entre les deux positions pour lesquelles le modèle de vue commence à se détériorer lorsque l'on tourne la vis de réglage dans le sens des aiguilles d'une montre et dans le sens contraire. Conseils pour ce réglage: Outre une forme d'ondes d'ensemble claire, régler pour obtenir des lignes relativement fines (se référer à la photographie 11-8), sur lesquelles des formes en "diamant" simple sont observées dans le modèle de vue.</li><li>Pour faciliter l'observation de la forme d'ondes, introduire une résistance de 10 Kohms (ou 5 Kohms s'il est difficile d'observer la forme d'ondes) dans le bout de la sonde comme indiqué par la figure 11-4.</li></ul> <div></div> <p>Fig. 11-4</p>



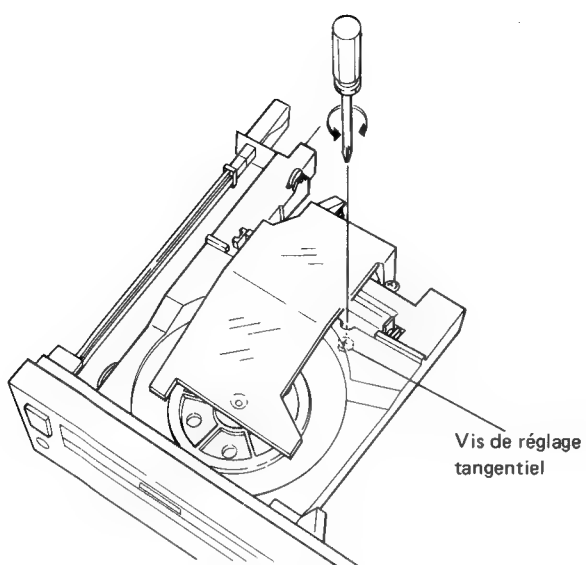
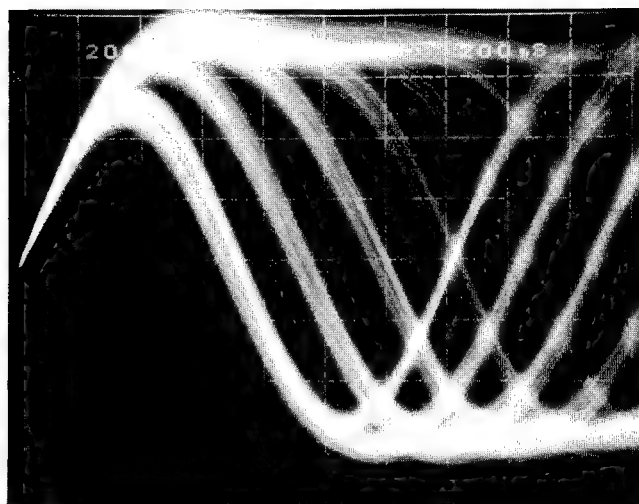
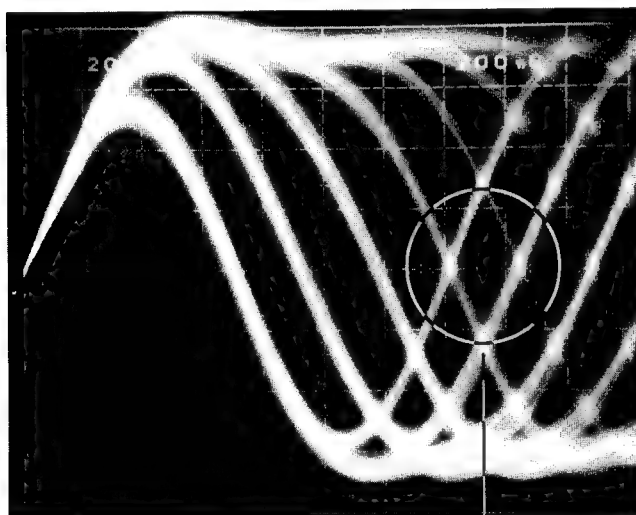


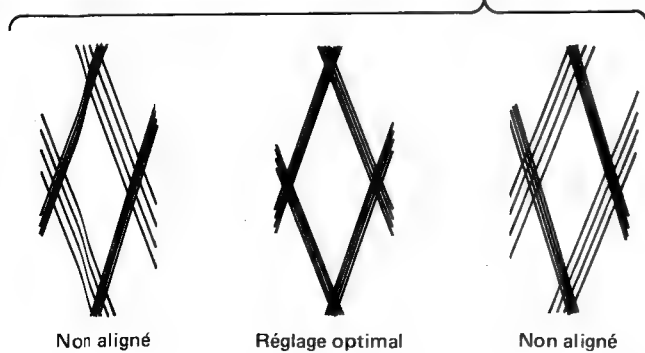
Fig.11-5 Réglage tangentiel



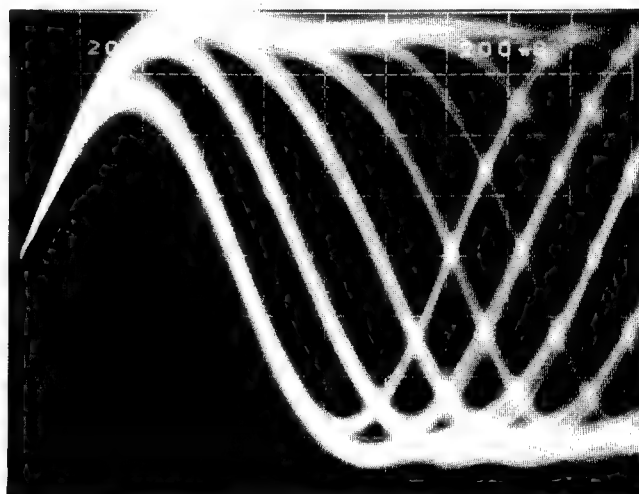
Photographie 11-9



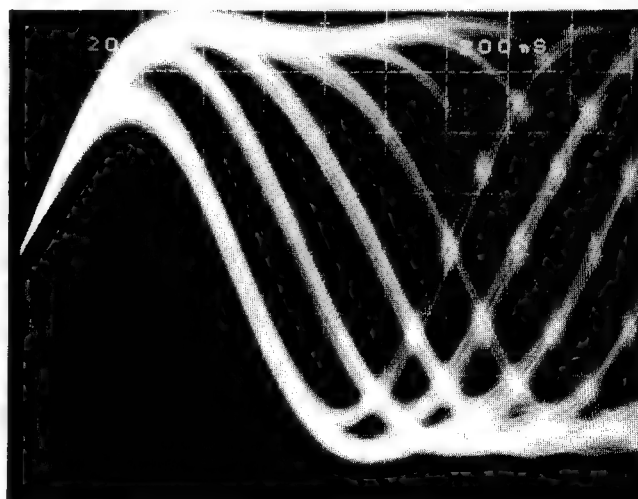
Point d'observation



Photographie 11-8



Photographie 11-10



Photographie 11-11

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/Spécifications de réglage	Procédure de réglage
	V	H				
7	REGLAGE DU GAIN DE MISE AU POINT					
			TP1 Broche 6 (FO.IN)  TP1 Broche 1 (FO.OT)	VR 3 (FO. GA)	DEL (vert) allumée	<ul style="list-style-type: none"><li>• Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>• Presser la touche STOP ( □ ) pour arrêter tous les mécanismes d'asservissement.</li><li>• Régler la fréquence et la tension de sortie de CH1 du dispositif de réglage F.T.G. sur 875 Hz et 0,2 Vc-c.</li></ul> <p><i>Note:</i> <i>Si l'on règle la tension de sortie au moyen de l'oscilloscope, débrancher le câble de la plaquette de circuit du dispositif de réglage F.T.G., et mesurer et régler au moyen de la sonde de l'oscilloscope en contact direct avec la broche 3 du connecteur N1 (fiche). (Ne pas mesurer au bout du câble, à cause du bruit généré). câble, à cause du bruit généré] câble, à cause du bruit généré).;</i></p> <ul style="list-style-type: none"><li>• Connecter le dispositif de réglage F.T.G. comme indiqué par la figure 11-6.</li><li>• Presser les touches TRACK FWD (▷▷), PLAY ( ▷ ) et PAUSE ( □□ ) selon cet ordre, pour mettre en route tous les mécanismes d'asservissement.</li><li>• Régler la commande VR3 FO.GA (gain de mise au point) du lecteur de disque compact, de telle manière que la DEL (verte) du dispositif de réglage F.T.G. s'allume.</li></ul> <div><div>LECTEUR DE DISQUE COMPACT</div><div><div>Broche 6 (FO.IN)</div><div>Broche 1 (FO.OT)</div><div>Broche 5 (MASSE)</div></div><div><div>FIL ORANGE</div><div>FIL MARRON</div><div>FIL NOIR</div></div><div><div>Dispositif de réglage F.T.G.</div><div>(R-878)</div></div></div> <p>Fig. 11-6</p> <div></div> <p>Photographie 11-12 Dispositif de réglage F.T.G.</p>

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/ Spécifications de réglage	Procédure de réglage
	V	H				
8	REGLAGE DE GAIN D'ALIGNEMENT					
			TP1 Broche 7 (TR.IN)  TP1 Broche 2 (TR.OT)	VR 4 (TR. GA)	DEL (verte) allumée	<ul style="list-style-type: none"><li>• Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>• Presser la touche STOP ( □ ) pour arrêter tous les</li><li>• Régler la fréquence et la tension de sortie du CH2 du dispositif de réglage F.T.G. sur 1125 Hz et 0,4 Vc-c.</li></ul> <p><i>Note:</i> Si l'on règle la tension de sortie au moyen de l'oscilloscope, débrancher le câble de la plaquette de circuit du dispositif de réglage F.T.G., et mesurer et régler au moyen de la sonde de l'oscilloscope en contact direct avec la broche 4 du connecteur N1 (fiche). (Ne pas mesurer au bout du câble, à cause du bruit généré).</p> <ul style="list-style-type: none"><li>• Connecter le dispositif de réglage F.T.G. comme indiqué par la figure 11-7.</li><li>• Presser les touches TRACK FWD (▷▷), PLAY (▷) et PAUSE (□□) selon cet ordre, pour mettre en route tous les mécanismes d'asservissement.</li><li>• Régler la commande de VR4 TR.GA (gain d'alignement) du lecteur de disque compact de telle manière que la DEL (verte) du dispositif de réglage s'allume.</li></ul> <div><div>LECTEUR DE DISQUE COMPACT TP 1</div><div><div>Broche 7 (TR.IN)</div><div>Broche 2 (TR.OT)</div><div>Broche 5 (MASSE)</div></div><div><div>FIL JAUNE</div><div>FIL ROUGE</div><div>FIL NOIR</div></div><div><div>Dispositif de réglage F.T.G.</div><div>(R-878)</div></div></div>

Fig. 11-7

No. d'étape	Position de l'oscilloscope		Points d'essai	Positions de réglage	Items de contrôle/Spécifications de réglage	Procédure de réglage
	V	H				
9	REGLAGE DE LA FREQUENCE DE FONCTIONNEMENT LIBRE VCO					
	0,5 V/div.		IC 8 (2/2) Broche 8		Ecrire la valeur intermédiaire de la forme d'ondes.	<ul style="list-style-type: none"><li>• Régler le lecteur en mode d'essai (se référer à la page 64).</li><li>• Presser la touche STOP (□) pour arrêter tous les mécanismes d'asservissement.</li><li>• Presser les touches TRACK FWD (▷◁) et PLAY (▷), selon cet ordre, pour fermer les mécanismes d'asservissement de mise au point et de l'axe.</li><li>• Observer la forme d'ondes à la broche 8 du IC8 (2/2) au moyen de l'oscilloscope dans ce cas. (V:0,5 V/div.). (Bien que C47, R83, R87, et les autres éléments de circuit soient connectés à la broche 8, la forme d'ondes peut s'observer facilement à partir des bouts du C47.</li><li>• Ecrire la valeur intermédiaire de la forme d'ondes à la broche 8 de IC8 (2/2).</li><li>• En utilisant le driver de noyau, régler le noyau VL1 (bobine VCO) de telle manière que la valeur intermédiaire de la forme d'ondes de l'oscilloscope soit identique à la valeur enregistrée précédemment lorsque la touche PAUSE (□) a été pressée pour mettre en route les mécanismes d'asservissement d'alignement.</li></ul>
	0,5 V/div.		IC 8 (2/2) Broche 8	Bobine VL1 (VCO)		

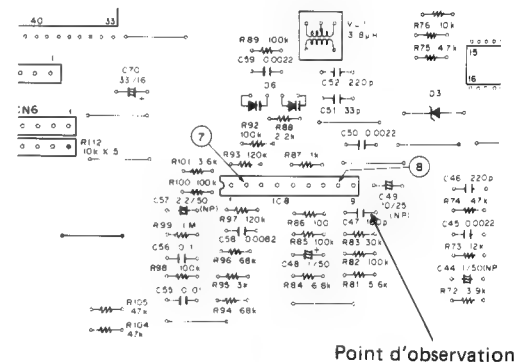


Fig. 11-8

## 11. AJUSTE

Los ajustes del Tocadoiscos Compacto se ejecutan en el siguiente orden:

### ● Items de Ajuste

1. Ajustes de desalineación y desenfoque.
2. Verificación de energía del LD (diodo láser)
3. Verificación del seguro del foco y del seguro del eje
4. Ajuste de la mira
5. Ajuste de equilibrio de alineación
6. Ajuste tangencial
7. Ajuste de ganancia de foco
8. Ajuste de ganancia de alineación
9. Ajuste de frecuencia de operación libre VCO

### ● Equipo de Medición

1. Osciloscopio de alineación dual
2. Medidor de energía óptico
3. Disco de prueba (YEDS7)
4. Filtros de ajuste de foco y alineación
5. Filtro de paso de banda para ajuste de ganancia de bucle
6. Generador de señales
7. Colocador de mira
8. Otros equipos de medición de uso común

### ● Mode de prueba

Los ajustes del tocadiscos se llevan a cabo en el modo de prueba.

#### Procedimientos de colocación y cancelación del modo de prueba

- (1) Encender el conmutador POWER (ENERGIA) (S401) mientras se presiona el conmutador TEST MODE (MODO DE PRUEBA) (S1).
- (2) Luego, encender el conmutador MANUAL SEARCH FWD (BUSQUEDA MANUAL HACIA ADELANTE) (▷▷) o el conmutador REV (REVERSA) (◁◁) para activar el modo de prueba.
- (3) El modo de prueba se cancela colocando el conmutador POWER en la posición apagado.

En la Tabla 11.1 se listan las variadas funciones de tecla.

### ● Controles de ajuste

- VR2: Desalineación (TR. OF)  
 VR3: Ganancia de foco (FO. GA)  
 VR4: Ganancia de alineación (TR. GA)  
 VR5: Equilibrio de alineación (TR. BL)  
 VR6: Desenfoque (FO. OF)  
 VL1: Operación libre de la VOC (bobina VOC)

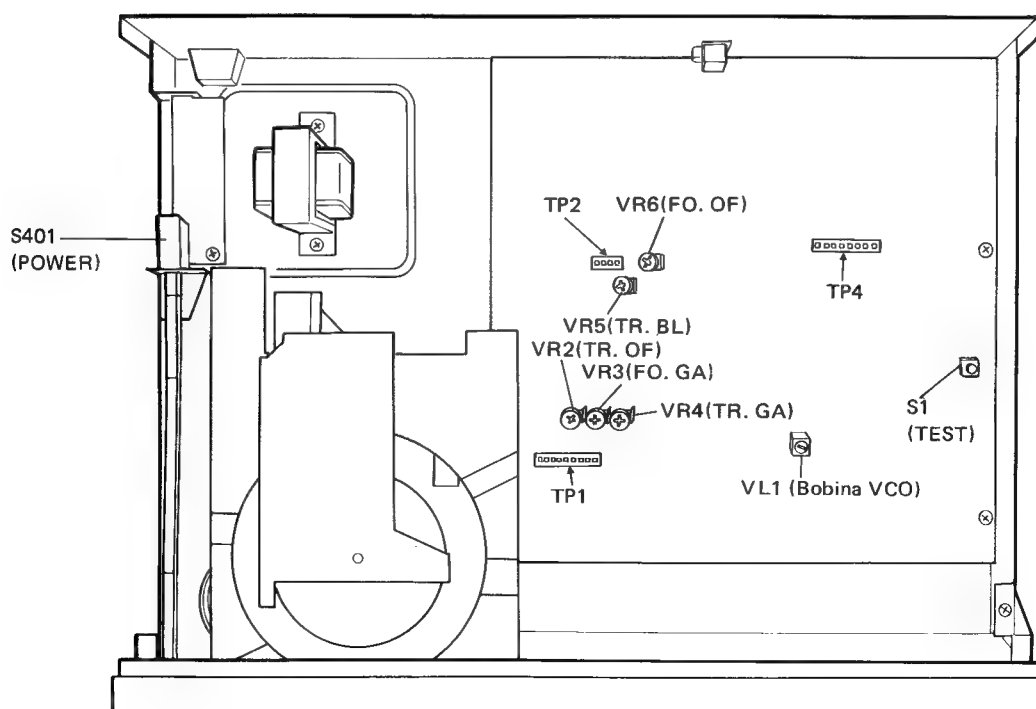
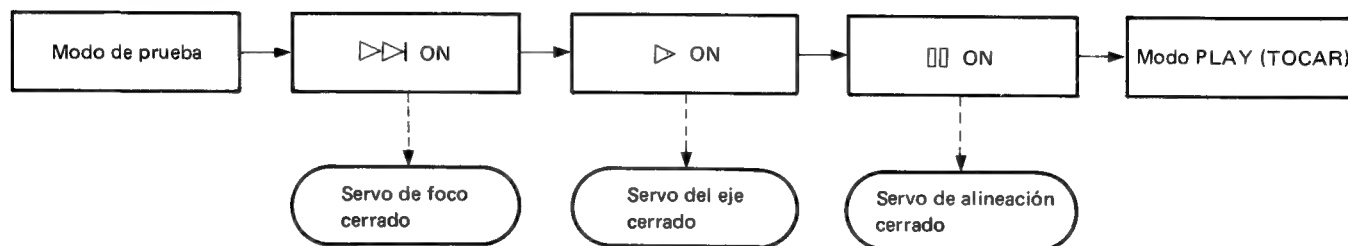


Fig. 11-1 Puntos de ajuste

Durante el modo de prueba cada mecanismo servo puede ser abierto o cerrado mediante operaciones separadas. En consecuencia cada servo debe ser cerrado, de a uno a la vez (en secuencia

serial) para regular el modo tocar. Notar que el modo tocar no se activa por la simple presión de la tecla PAUSE (PAUSA) (□□) durante el modo de prueba.

Ejemplo: Cambiar desde el modo detenido al modo tocar.



- Los mecanismos servo cumplen con un secuencia serial durante el modo de prueba.

#### • Funciones de teclas en el modo de prueba

Símbolo	Tecla	Función durante el modo de prueba	Descripción
▷▷	TRACK FWD (ALINEACION HACIA ADELANTE)	El servo del foco se cierra.	El diodo láser se enciende, el accionador del foco se mueve hacia arriba/abajo, y el servo del foco se cierra.
▷	PLAY (TOCAR)	El servo del eje se cierra.	El servo del eje se cierra en el modo CLV-A después que el motor de la aguja es arrancado.
□□	PAUSE (PAUSA)	Servo de alineación cerrado/abierto.	El servo de alineación se cierra presionandolo por palanca, y el tocadiscos es puesto en el modo tocar (con los servos de foco y eje cerrados). El indicador PAUSE se enciende y el servo de alineación se abre al presionarlo por segunda vez.
◁◁	MANUAL SEARCH REV (BUSQUE MANUAL EN REVERSA)	El carro se devuelve (hacia el centro del disco).	El carro se mueve hacia el control del disco a una velocidad rápida de aproximadamente 1 cm/seg. Como no existe mecanismo de seguridad para detener el carro, cuidese de no moverlo demasiado hacia el centro.
▷▷	MANUAL SEARCH FWD (BUSQUEDA MANUAL HACIA ADELANTE)	El carro se mueve hacia adelante (hacia el borde del disco).	El carro se mueve hacia el borde del disco a una velocidad rápida de aproximadamente 1 cm/seg. Como no existe mecanismo de seguridad para detener el carro, cuidese de no moverlo demasiado hacia el centro.
□	REPEAT (REPETIR)	El lente se mueve hacia arriba/abajo.	El diodo láser se enciende y el accionador del foco se mueve hacia arriba/abajo. No se cierra el cervo del foco.
□	STOP (PARAR)	Parar.	Todos los servos se detienen y se recolocan en su estado inicial.
△	CERRADO/ABIERTO	(Bandeja de discos) abierta/cerrada.	La bandeja de discos está abierta/cerrada. Notar que el brazo de fonocaptor no regresa al soporte del brazo cuando la bandeja se abre, y permanece en la misma posición al cerrar la bandeja.

Tabla 11-1

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
1	AJUSTES DE DESALINEACION Y DESENFQUE					
			TP1 Pasador 9 (TR.RT)	VR 2 (TR. OF)	0V ± 10mV	<ul style="list-style-type: none"><li>• Poner el tocadiscos en el modo de prueba (véase la página 75).</li><li>• Ajustar la tensión en el TP1 pasador 9 TR.RT (retorno de alineación) en 0 V ± 10 mV girando el control VR2 TR.OF (desalineación).</li><li>• Colocar el medidor de energía óptica directamente sobre el objetivo y verificar que la energía LD satisfice las condiciones nominales especificadas.</li></ul>
			TP 1 Pasador 3 (FO.ER)	VR 6 (FO.OF )	0V ± 10mV	
2	VERIFICACION DE ENERGIA LD (DIODO LASER)					
				VR 1	Condiciones nominales especificadas (0.26mW ± 0.02mW)	<ul style="list-style-type: none"><li>• Ajustar en el modo de prueba. (El modo normal puede ser ajustado conmutando el conmutador de alimentación en la posición de apagado y encendido).</li><li>• Colocar el sensor del medidor de energía óptica directamente sobre el objetivo.</li><li>• Presionar la tecla del modo de tocar PLAY sin cargar el disco y verificar si el valor de energía del LD (diodo láser) indicado por el medidor de energía óptica está entre los límites especificados (0,26 mW ± 0,02 mW).</li></ul>
3	VERIFICACION DEL SEGURO DEL FOCO Y DEL FOCO DE LA AGUJA					
	V 0.5V/div.	H 100 mseg/ div	TF2 pasador 4 (salida RF)		Salida RF generada  Rotación normal	<ul style="list-style-type: none"><li>• Cargar el disco de prueba.</li><li>• Colocar el tocadiscos en el modo de prueba (véase la página 75).</li><li>• Presionar la tecla MANUAL SEARCH FWD para mover el fonocaptor a aproximadamente el centro del disco. Nótese que este paso debe ser ejecutado.</li><li>• Observar TP2 pasador 4 RF (salida RF) mediante el osciloscopio para verificar si se genera una señal de salida RF cuando se presiona tecla TRACK FWD (▷◁).</li><li>• Presionar la tecla PLAY ( ▷ ) y verificar que el disco gira a velocidad normal (aproximadamente 300 rpm cerca del centro del disco) en la dirección correcta (en el sentido de los punteros del reloj).</li></ul>

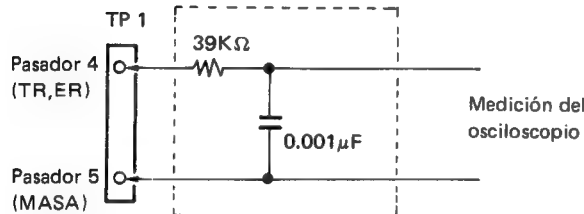
No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
4	AJUSTE DE LA MIRA					
			TP 1 pasador 4 (TR,ER)	Mira	Posición NULL (NULA)	<ul style="list-style-type: none"><li>• Cargar el disco de prueba</li><li>• Poner el tocadiscos en el modo de prueba (véase la página 75).</li><li>• Presionar las teclas TRACK FWD (▶▶) y PLAY (▶) para cerrar los servos del foco y del eje (dejando el servo de alineación abierto).</li><li>• Usando la tecla MANUAL SEARCH FWD (▶▶) mover el fonocaptor a una posición cercana al centro del disco y verifique que el colocador de mira (R-122) puede entrar en el orificio de ajuste de la mira desde el lado izquierdo del equipo moviendo el fonocaptor. (Véase la Figura 11-3)</li><li>• Observar que la forma de onda del TP1 pasador 4 TR.ER., mediante un osciloscopio. Insertar un filtro de paso bajo "de corte" en esta etapa. (Véase la Figura 11-2)</li></ul>
<div><p style="text-align: center;">L.P.F.</p></div> <p style="text-align: center;">Fig. 11-2</p>						
				Mira	Amplitud máxima	<ul style="list-style-type: none"><li>• Insertar el colocador de mira en el orificio de ajuste y girar el colocador hasta encontrar el punto NULL (Véase la fotografía 11-1)</li><li>• En esta etapa vuelva a presionar gentilmente el fonocaptor con un destornillador, como se indica en la Fig. 11-3 par evitar que el fonocaptor se levanto cuando se gira el colocador de mira.</li><li>• A continuación gire lentamente el colocador de mira en el sentido de los punteros del reloj desde la posición NULL y ajuste la posición en que la forma de onda más alta (señal de error de alineación) primero alcanza la amplitud máxima (Véase la Figura 11-3).</li></ul>
			Eje X TP2 pasador 1 (SKTE)	Mira	Lissajous 45°	<p><i>Nota:</i> Presionar hacia abajo el colocador de mira para asegurar que el fonocaptor no sea en suspensión en el aire.</p> <ul style="list-style-type: none"><li>• Conectar el TP2 pasador 1 (BKTE) al eje X del osciloscopio, y el pasador 2 (FWTE) al eje Y mediante el acoplamiento CA y observar el patrón de Lissajous (véase la fotografía 11-4)</li></ul>
			Eje Y TP2 pasador 2 (FWTE)			<ul style="list-style-type: none"><li>• Efectuar el ajuste fino del colocador de mira a la posición en la cual el patrón Lissajous es prácticamente una línea derecha (Lissajous 45°). (Veáse la fotografía 11-5)</li></ul>

Fig. 11-2



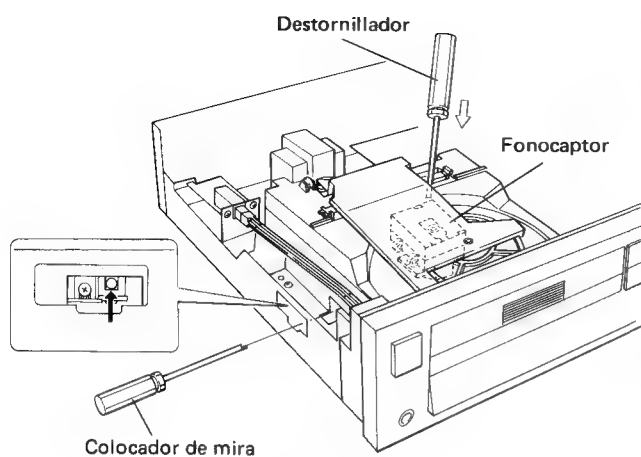
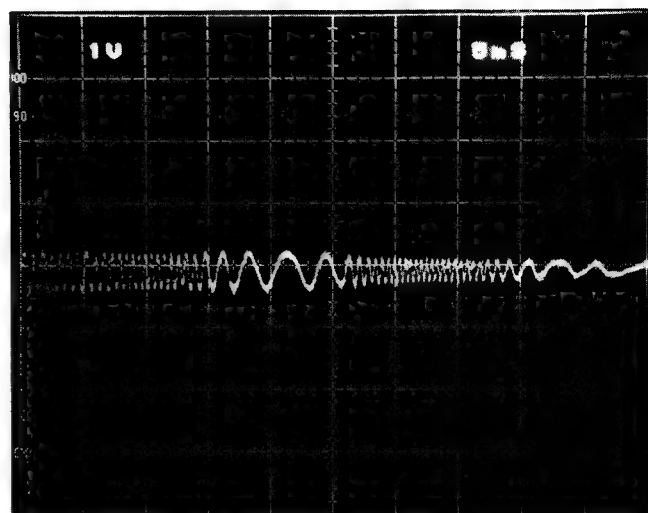
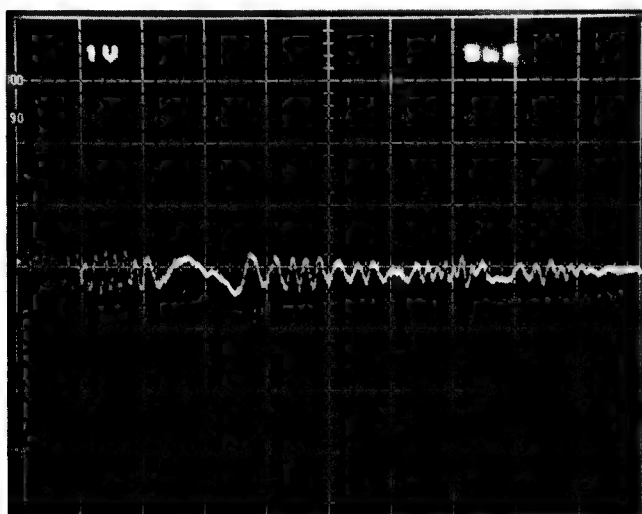


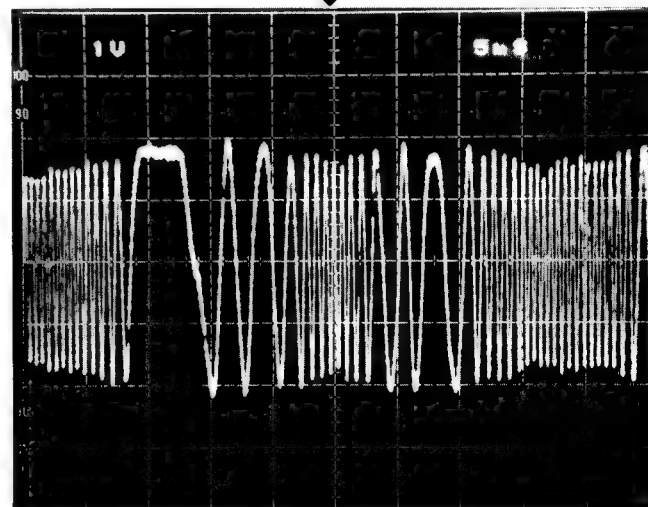
Fig. 11-3 Ajuste de mira



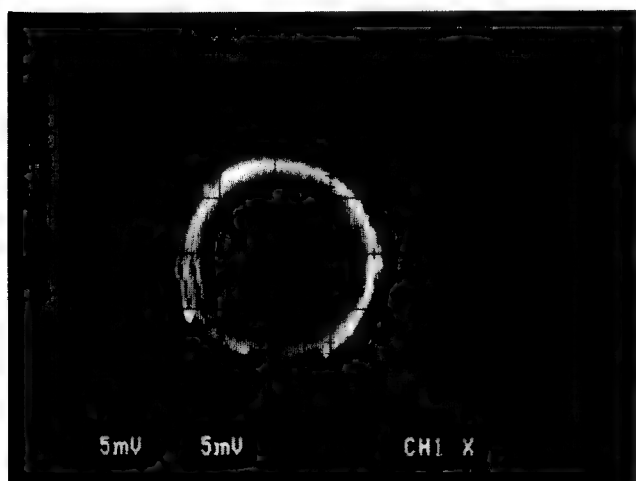
Fotografía 11-1 Punto NULL



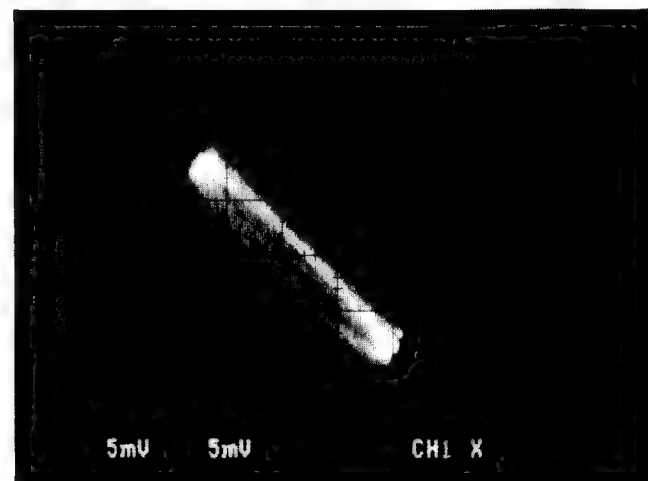
Fotografía 11-2 Forma de onda más allá del punto NULL



Fotografía 11-3 Amplitud máxima

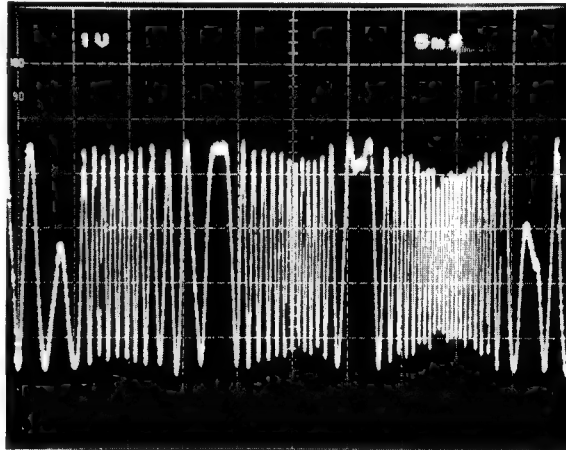


Fotografía 11-4

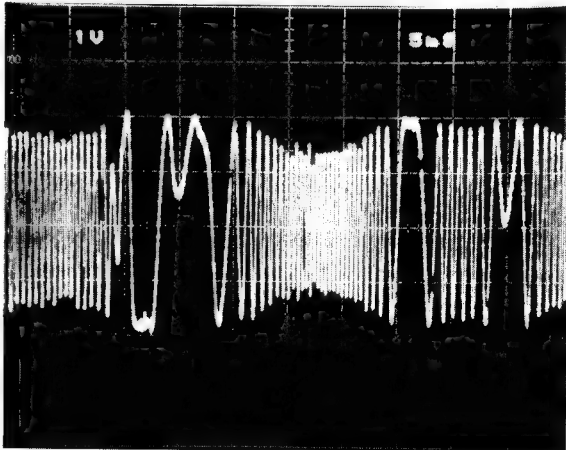


Fotografía 11-5

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
5	AJUSTE DE EQUILIBRIO DE ALINEACION					
	1 V/div.	5 mseg/ div.	TP1 pasador 4 (TR,ER)	VR 5. (TR,BL)		<ul style="list-style-type: none"><li>• Cargar el disco de prueba.</li><li>• Poner el tocadiscos en el modo de prueba (véase la página 75).</li><li>• Mueva el carro a una posición cerca del centro del disco usando la tecla MANUAL SEARCH FWD (▷▷).</li><li>• Presionar la tecla TRACK FWD (▷▷) y luego la tecla PLAY (▷) para que el disco comience a girar.</li><li>• Observar TP1 pasador 4 TR,ER (error de alineación) en el osciloscopio y eliminar el componente de C.C. del error de alineación ajustando el control VR5 TR,BL (equilibrio de alineación).</li></ul>



Fotografía 11-6 Componentes de C.C. incluidos



Fotografía 11-7 Componentes de C.C. excluidos

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
6	AJUSTE TANGENCIAL					
			TP2 pasador 4 (Salida RF)	Tornillo de ajuste tangencial	Mejor patrón de vista	<div><ul style="list-style-type: none"><li>● Cargar el disco de prueba.</li><li>● Colocar el tocadiscos en el mode de prueba (véase la página 75).</li><li>● Mover el fonocaptor al borde del disco usando la tecla MANUAL SEARCH FWD (▷), para permitir que el tornillo de ajuste tangencial se vea desde el lado izquierdo (véase la Figura 11-5).</li><li>● Presionar las teclas TRACK FWD (▷), PLAY (▷) y PAUSE (⏏) para cerrar todos los servos. (Se encenderá el indicador de pausa.)</li><li>● Observar el TP2 pasador 4 RF (salida RF) en el osciloscopio, y ajustar mediante el tornillo de ajuste tangencial para obtener el patrón de vista más claro. (Fig. 11-5.)</li><li>● La posición óptima es el punto medio entra las dos posiciones donde el patrón de vista comienza a deteriorarse cuando el tornillo de ajuste tangencial se gira en el sentido de los punteros de reloj y en el sentido contrario. Guías para el ajuste: Además de una formade onda general clara, se debe ajustar para obtener líneas relativamente finas (véase la fotografía 11-5), donde se observan formas de "diamante" simple en el patrón de vista.</li><li>● Para facilitar la observación de la forma de onda más fácil de observar, insertar una resistencia de 10 Kohm (o 5 Kohm si la forma de onda es difícil de distinguir) en la punta del probador, como se indica en la Figura 11-4.</li></ul></div>

TP 2

Pasador 4 (RF)

10KΩ

Pasador 3 (MASA)

Fig. 11-4

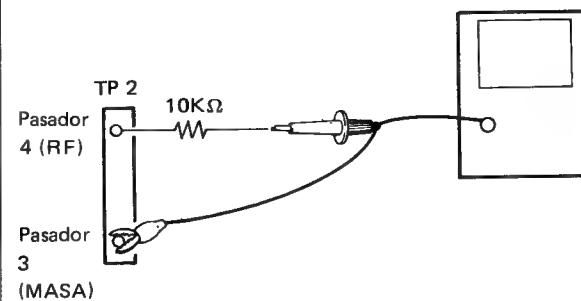


Fig. 11-4

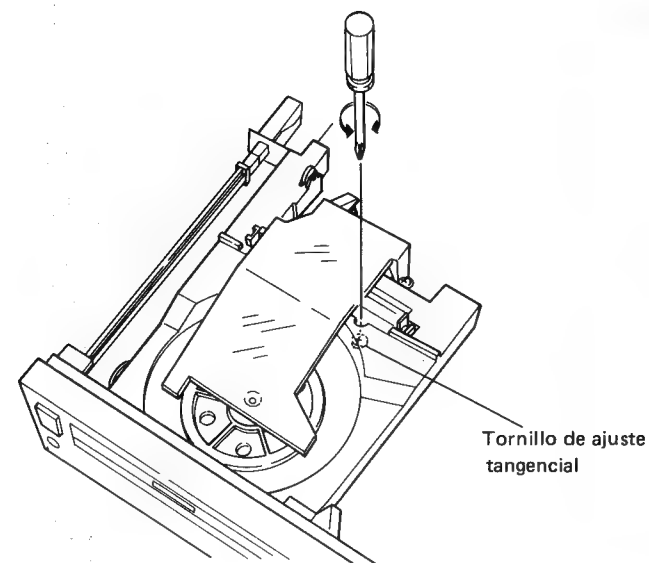
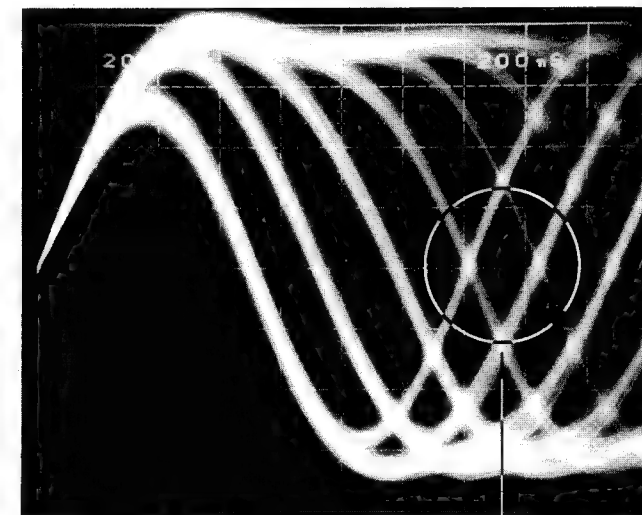
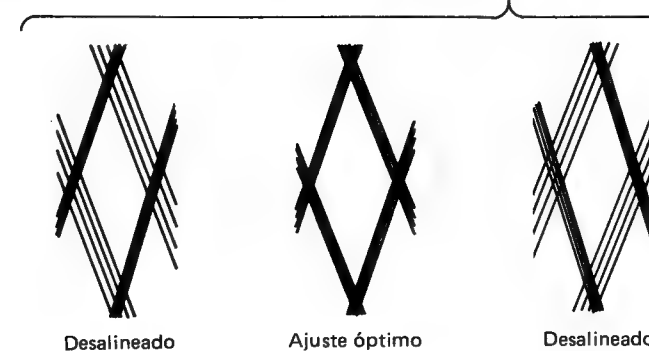


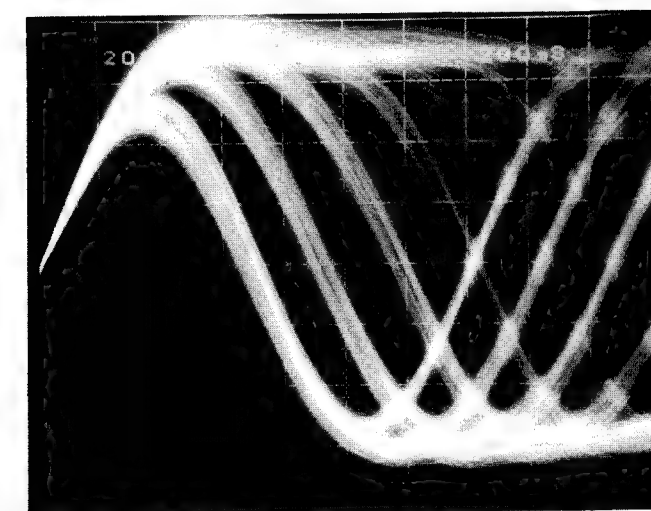
Fig. 11-5 Ajuste tangencial



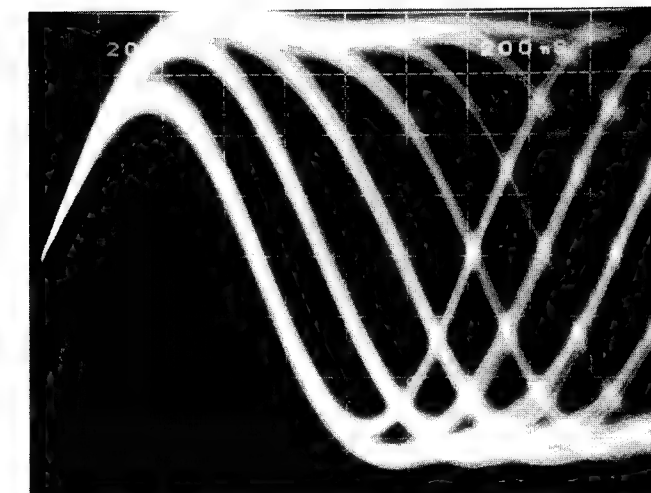
Punto de observación



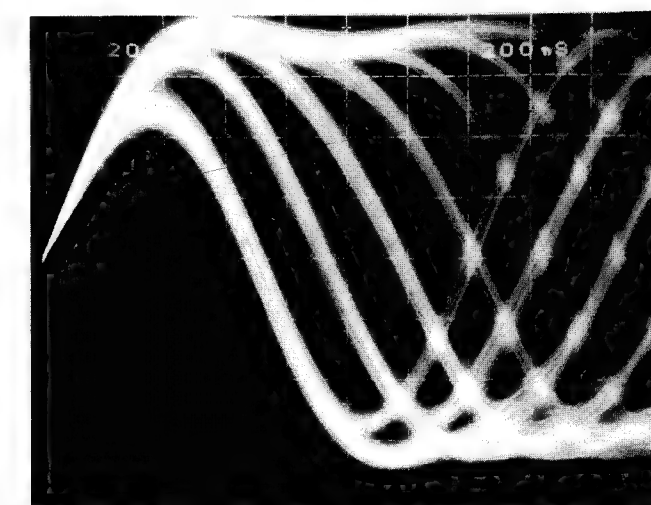
Fotografía 11-8



Fotografía 11-9



Fotografía 11-10



Fotografía 11-11

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
7	AJUSTE DE GANANCIA DE FOCO					
						<div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div></div> 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No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Items de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
8	AJUSTE DE GANANCIA DE ALINEACION					
			TP 1 Pasador 7 (TR,IN)  TP1 Pasador 2 (TR.OT)	VR 4 (TR. GA)	LED (verde) encendida	<ul style="list-style-type: none"><li>● Colocar el tocadiscos en el modo de prueba (véase página 75).</li><li>● Presionar la tecla STOP ( □ ) para apagar todos los servos.</li><li>● Ajustar la frecuencia y la tensión de salida del CH2 del ajustador F.T.G. a 1125 Hz y 0.4 Vp.p. <i>Nota:</i> <i>Si se ajusta la tensión de salida mediante un osciloscopio, desconectar el cable del tablero de circuito del ajustador F.T.G., mida y ajustar el probador del osciloscopio en contacto directo con el pasador 4 del conector N1 (enchufe). (Debido al zumbido generado, no efectúe mediciones en la punta del cable.)</i></li><li>● Conectar el ajustador F.T.G. como se indica en la Figura 11-7.</li><li>● Presionar las teclas TRACK FWD ( ⏮ ), PLAY ( ▶ ) y PAUSE ( ⏏ ) en el orden para encender todos los servos.</li><li>● Ajustar el control VR4 TR.GA (ganancia de alineación) del tocadiscos compacto de manera que en el ajustador F.T.G. sólo el LED (verde) se encienda.</li></ul> <div><div>TOCADISCOS COMPACTOS</div><div><div>TP 1</div><div>Pasador 7 (TR.IN)</div><div>Pasador 2 (TR.OT)</div><div>Pasador 5 (MASA)</div></div><div><div>ALAMBRE AMARILLO</div><div>ALAMBRE ROJO</div><div>ALAMBRE NEGRO</div></div><div><div>AJUSTADOR F.T.G.</div><div>(R-878)</div></div></div>

Fig. 11-7

No. de paso	Posición del osciloscopio		Puntos de chequeo	Posiciones de ajuste	Ítems de verificación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
9	AJUSTE DE FRECUENCIA DE OPERACION LIBRE VCO					
	0,5 V/div		IC 8 (2/2) Pasador 8		Escribir el valor medio de la forma de la curva	<ul style="list-style-type: none"><li>Colocar el tocadiscos en el modo de prueba (véase la página 75).</li><li>Presionar la tecla STOP ( <input type="checkbox"/> ) para apagar todos los servos.</li><li>Presionar las teclas TRACK FWD ( <input type="checkbox"/> ) y PLAY ( <input type="checkbox"/> ) en el orden para cerrar los servos de foco y del eje.</li><li>Luego observar la forma de onda en el pasador 8 del IC 8 (2/2) mediante el osciloscopio (V: 0,8 V/div.) (Aunque C47, R83, R87, y otros elementos de circuito están conectados al pasador 8, la forma de onda puede ser observada fácilmente desde la punta de C47.)</li><li>Escribir el valor medio de la forma de onda en el pasador 8 del IC 8 (2/2).</li><li>Usando un colocador de núcleo, ajustar el núcleo VL1 (bobina VCO) de manera que el valor medio de la forma de onda del osciloscopio sea el mismo que el valor registrado previamente cuando la tecla PAUSE ( <input type="checkbox"/> ) fue presionada para encender el servo de alineación.</li></ul>
	0.5V/div		IC 8 (2/2) Pasador 8	Bobina VL 1 (VCO)		

Punto de observación

Fig. 11-8

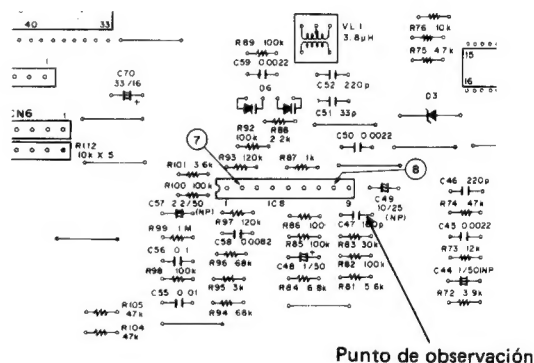


Fig. 11-8

## 12. FOR KC, HEM and HB TYPES

- Model PD-6010/KC, HEM and HB are the same as the PD-6010/KU with the exception of this supplement.

### Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.			
		PD-6010(BK)/KU	PD-6010(BK)/KC	PD-6010(BK)/HEM	PD-6010(BK)/HB
▲ ★	Power transformer (120V)	PTT-233	PTT-234	...	...
▲ ★	Power transformer (220/240V)	...	...	PTT-235	PTT-235
▲	AC power cord	PDG-046	PDG-046	PDG-037	PDG-062
▲	Strain relief	CM-22	CM-22	CM-22B	CM-22B
▲	AC socket (AC OUTLETS)	PKN-003	...	...	...
	Packing case	PHH-273	PHH-273	PHH-274	PHH-274
	Operating instructions (English)	PRB-297	PRB-297	...	PRB-297
	Operating instructions (English/German/French/Italian)	...	...	PRE-047	...

- The exterior components of PD-6010(BK)/HEM differ from PD-6010/HEM and PD-6010/HB as follows;

Mark	Symbol & Description	Part No.			Remarks
		PD-6010(BK)/HEM	PD-6010/HEM	PD-6010/HB	
	Front panel (D)	PAN-097	PAN-100	PAN-100	
	Function panel (D)	PNY-450	PNY-451	PNY-451	
	Knob cap (A) (PLAY)	PAC-236	PAC-235	PAC-235	
	Knob cap (A) (PAUSE)	PAC-238	PAC-237	PAC-237	
	Knob cap (STOP)	PAC-240	PAC-239	PAC-239	
	Knob cap (A) (TRACK)	PAC-242	PAC-241	PAC-241	
	Knob cap (B) (TRACK)	PAC-244	PAC-243	PAC-243	
	Knob cap (A) (MANUAL)	PAC-246	PAC-245	PAC-245	
	Knob cap (B) (MANUAL)	PAC-248	PAC-247	PAC-247	
	Knob cap (PROGRAM)	PAC-250	PAC-249	PAC-249	
	Button (REPEAT)	PAC-270	PAC-269	PAC-269	
	Button (OPEN/CLOSE)	PAC-252	PAC-251	PAC-251	
	Button (B) (POWER)	PAC-254	PAC-253	PAC-253	
	Bonnet	PNA-225	PNA-224	PNA-224	
	Packing case	PHH-274	PHH-275	PHH-275	
	Operating instructions (English)	...	...	PRB-297	
	Operating instructions (English/German/French/Italian)	PRE-047	PRE-047	...	

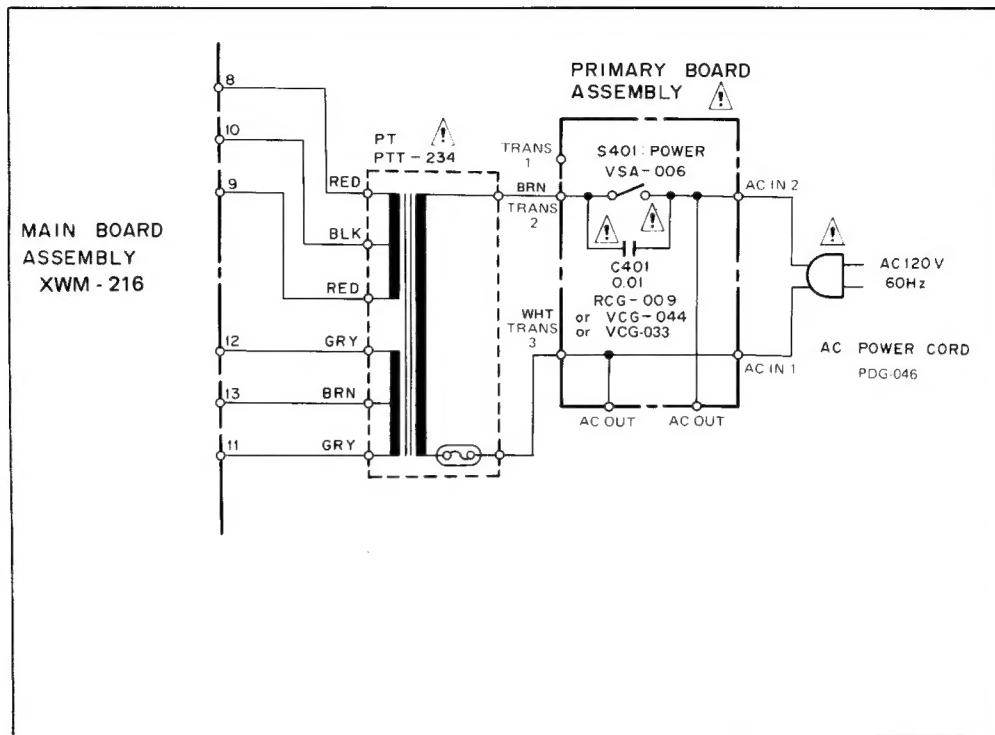
### Line Voltage Selection for HEM and HB Types

- Disconnect the AC power cord.
- Remove the bonnet case.
- Change the connection of the power transformer primary lead wires as follows:  
220V: Connect the blue lead wire to the TRANS 2 terminal on the primary board assembly and connect the violet lead wire to the TRANS 1 terminal.

- 240V: Connect the blue lead wire to the TRANS 1 terminal on the primary board assembly and connect the violet wire to the TRANS 2 terminal.
- Stick the line voltage label on the rear panel.

Description	Part No.
220V label	AAX-193
240V label	AAX-192

- For KC Type



- For HEM and HB Types

